



ANNALS OF THE  
ROYAL COLLEGE  
OF SURGEONS  
OF ENGLAND

VOLUME 27

OCTOBER 1960

No. 4

# Hypon



## analgesic and antipyretic tablets

— \* —

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**Dose:** 2 tablets every four hours or as prescribed.

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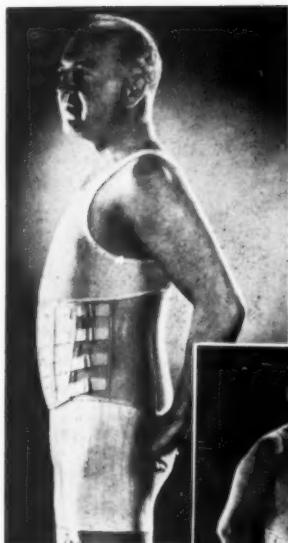
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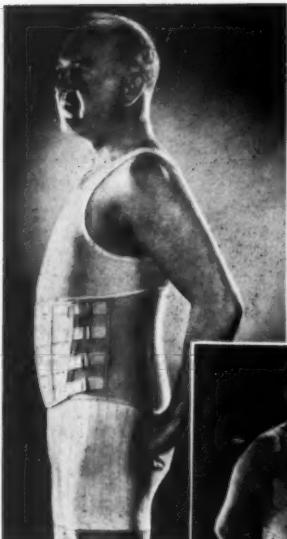
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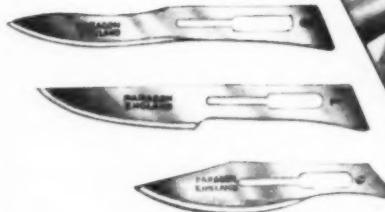
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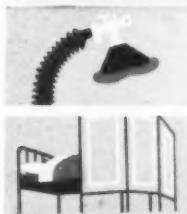
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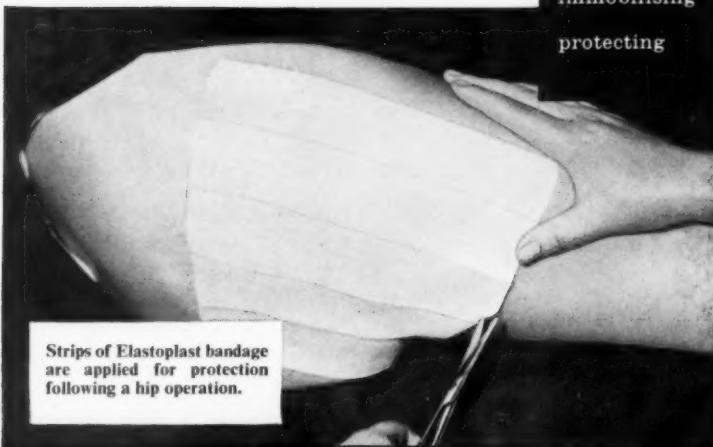
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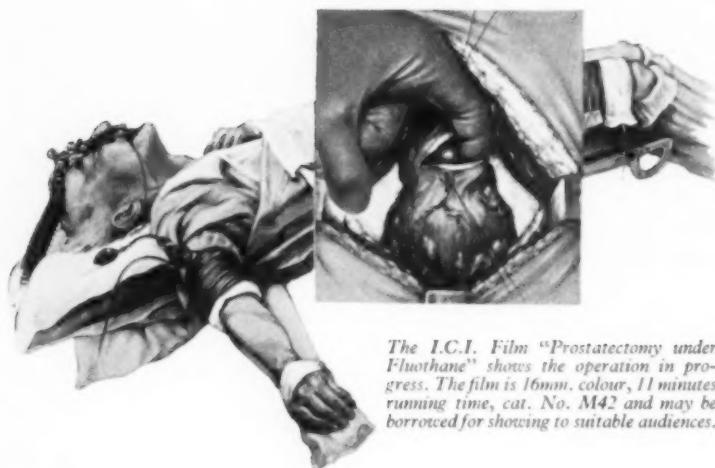
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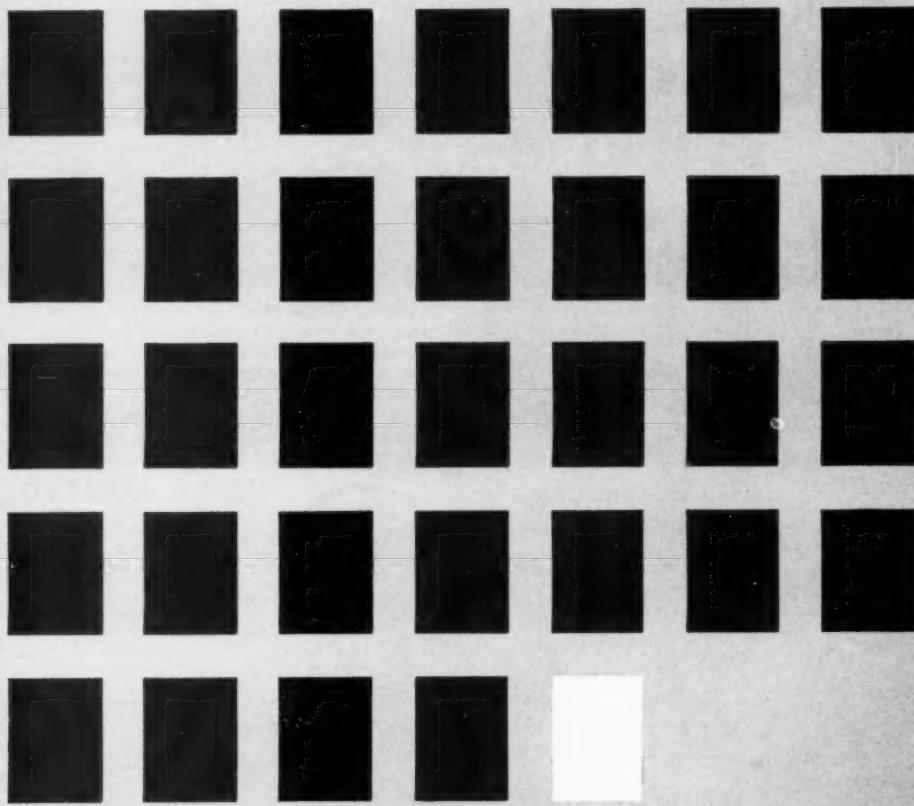
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## SURGERY IN CANCER OF THE MOUTH

Hunterian Lecture delivered at the Royal College of Surgeons of England

on

23rd March 1960

by

**Howard H. Eddey, B.Sc., F.R.C.S., F.R.A.C.S.**

The Royal Melbourne Hospital, Australia

THE ANTI-CANCER COUNCIL of Victoria established a central cancer registry in Melbourne in 1940 and in it a complete record and follow-up of all cancer patients admitted to the major metropolitan hospitals is kept. Similar central cancer registries have been established in Denmark (1942), France (1943), England and Wales (1945), New Zealand (1948), Norway (1952), Finland and Belgium (1953) and in Ireland, Israel and the Netherlands in 1954. In the United States of America several states have introduced cancer registries—Massachusetts (1927), Connecticut and New York State (1940), California (1947) and Pennsylvania (1948). Because of the availability of these records in Melbourne and because of the uniform system of reporting the detailed information on each patient which has been established, a review of the methods and results of treatment in cancer of the mouth seemed desirable, since this has not previously been done in Victoria and because the pattern of treatment is changing with the renewed interest of surgeons and with the development of new radiotherapy equipment and techniques. The treatment of cancer of the tongue was first placed on a sound basis following the work of Syme (1865) and Butlin (1885), and in 1913 Trotter, in his two Hunterian lectures, described the current surgical practice in the treatment of cancer of the mouth and pharynx. With the advent of radiotherapy at the turn of the century the treatment of cancer of the mouth largely, and in some centres entirely, passed from the surgeon, but in the post-war era a renewed surgical interest has developed associated with a radical surgical attack on this as on other cancers particularly by American surgeons such as Sugabaker and Gilford (1946), Kremen (1951), Slaughter and Southwick (1952), Carroll (1952) and others.

In my country we have not subscribed too early or too quickly to radical surgery in cancer of the mouth. Nevertheless the change from the plan of radiotherapy always to the primary lesion, radiotherapy or indifferent surgery to the cervical lymph node metastases and the palliative treatment only given to many mouth lesions in elderly people which infiltrated widely or involved bone that was the pattern of the first four decades of this century, to treatment of these tumours by surgery and radiotherapy combined and to the safe and extensive primary surgery that has characterized the fifth and sixth decades, is dramatic. It is with the latter

## HOWARD H. EDDEY

period that I propose to deal and to discuss the methods of treatment, the results and the plans for progress in an attempt to improve our results which are rather similar to those reported in the literature by Martin *et al.* (1940), Martin (1948), Ledlie and Harmer (1950), Windeyer (1953), Cade (1953), Cade and Lee (1957) and others (Table 1).

TABLE I  
PERCENTAGE OVERALL FIVE-YEAR SURVIVAL

Author	Number of cases	Tongue	Floor of mouth	Cheek mucosa	Palate
Martin <i>et al.</i> (1940)	556	25			
Martin (1948)		28	25	29	31
Gibbel <i>et al.</i> (1949)	330	14.2			
Ledlie and Harmer (1950)	800	20	25	16.5	19.5
Mattick <i>et al.</i> (1952)	82		18		
Windeyer (1953)	131		28.7		
Cade (1953)	118		27		
Cade and Lee (1957)	653	27			
Shedd <i>et al.</i> (1958)	91	20.4			

Whilst a prisoner of war in Malaya and Borneo a number of natives with carcinoma of the cheek, so well described by Somervell (1944) and Paymaster (1956) and attributed by them to the chewing of betel nut mixed with tobacco and slaked lime, had been observed. This interest in mouth cancer was stimulated by a visit to Melbourne in 1947 of Sir Gordon Gordon-Taylor and his demonstration of the technique and problems associated with radical neck dissection in my operating theatre at the Royal Melbourne Hospital, based on such a sound anatomical knowledge, would surely have met with the approval of John Hunter. To investigate facets of this problem in Melbourne, the period 1946 through 1958 has been chosen as during this period 106 personal radical neck and combined mouth and neck dissections on 93 patients have been carried out and all case histories of patients registered with the central cancer registry have been reviewed. In this review consideration has been given to epithelioma of the anterior two-thirds of the tongue, the floor of the mouth, the buccal mucosa and the hard and soft palate. Other less common mouth cancers have been excluded as well as epithelioma of the lip, the posterior one-third of the tongue, the tonsil and the pharynx because the disease in these situations presents other problems not properly discussed here. No specific attempt has been made to consider separately the four regions of the mouth since it is only in an early stage that an epithelioma is confined strictly to one part. There is no fundamental difference in the disease as it affects each part (Carroll,

#### SURGERY IN CANCER OF THE MOUTH

1952) and the basic surgical problems associated with treatment are the same. The too detailed analysis of the effect of variation in site, size, gross appearance and histology of the lesions on treatment and results often ends in confusion. What is important is whether the tumour has infiltrated deeply, has involved bone or has metastasized to the cervical lymph nodes.

#### INCIDENCE OF EPITHELIOMA OF THE MOUTH IN VICTORIA

The annual death rate from cancer of the mouth and pharynx in Victoria per million of mean population taken over a thirty-year period from 1929 and compiled by the Commonwealth statisticians department shows a striking decrease in the frequency of this disease in men (Fig. 1). This

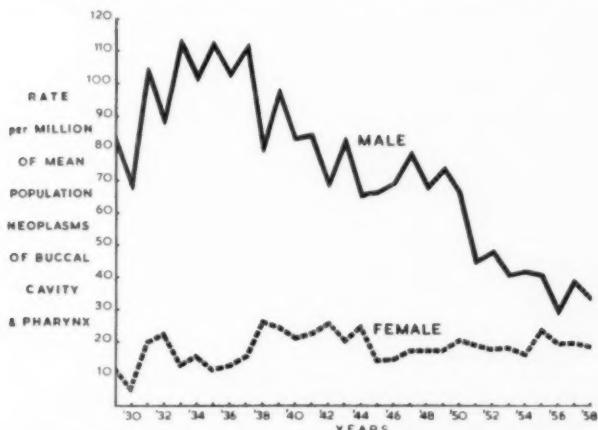


Fig. 1. Graph showing the annual male and female death rate from cancer of the mouth and pharynx in Victoria per million of mean population 1929-1958.

decrease is reflected in the percentage of total (less skin) cancer cases suffering from epithelioma of the mouth registered with the central cancer registry over a thirteen-year period from 1946 (Fig. 2). In estimating these latter percentages it is necessary to exclude skin cancer because of the large number of patients in Victoria who suffer from basal cell carcinoma.

The significance of this decrease (previously noted by Cade, 1949) merits some consideration. Wynder and Bross (1957) and Wynder *et al.* (1957) have discussed the various aetiological factors in mouth cancer and pointed out that smoking and particularly pipe and cigar smoking, alcohol consumption, syphilis, dental irritation from jagged teeth or from an ill-fitting denture, nutritional deficiencies and the taking

HOWARD H. EDDEY

of hot beverages and food may play some part in the production of this condition. In a series of 90 consecutive patients treated with Dr. R. Kaye Scott it was noted that alcohol had been consumed in considerable quantities and for long periods by 25 per cent. of patients, 40 per cent. were cigarette smokers and leukoplakia was seen in 28 per cent. 62 per cent. were edentulous on presentation and one-quarter of these regarded their lesion as the result of irritation from an ill-fitting denture. Ten per cent. blamed jagged teeth and certainly the relationship of the epithelioma to the jagged tooth or to the ill-fitting denture often appeared more than fortuitous. Nutritional atrophic glossitis occurred in only three patients so that this condition is not a predisposing factor as it is in Swedish women.

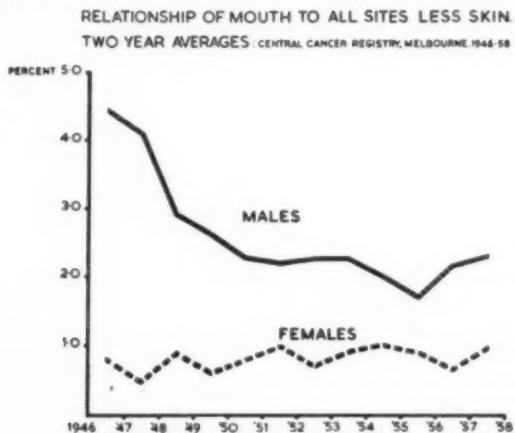


Fig. 2. Graph showing the percentage, male and female, of total cancer cases (less skin) suffering from epithelioma of the mouth registered with the Central Cancer Registry 1946-1958.

A positive Wassermann reaction occurred in 20.6 per cent. of 136 cancer registry patients tested (Martin *et al.*, 1940, 33 per cent.; Gibbell *et al.*, 1949, 21.8 per cent.; Ledlie and Harmer, 1950, 16 per cent.; Du Val and Healy, 1956, 16 per cent.; Perzik *et al.*, 1958, 22 per cent.) and a possible decrease in the frequency of syphilitic glossitis and in pipe smoking with better general dental care may account for the diminution in the frequency of this disease in men in Victoria.

### THE MOUTH LESION

#### Primary treatment

Surgery has not played a significant part in the initial treatment of the primary lesion, except in the last two decades when, under certain circum-

#### SURGERY IN CANCER OF THE MOUTH

stances, a combined mouth and neck dissection has been carried out. For early and moderate sized lesions a radon implant in one or two planes depending on the size of the lesion has been carried out. Radium needle implants have not often been used principally because this method produces increased discomfort, a longer hospital stay and some risk of sepsis along the needle tracks. Megavoltage therapy will probably replace radon implants and a second linear accelerator will be in operation at the Peter MacCallum Clinic in Melbourne by the end of this year. All teeth have been removed prior to radiotherapy as gum and dental sepsis has been common and there is no risk of osteomyelitis of the mandible following treatment providing the tooth sockets are covered with granulation tissue. Seeding of tumour onto a raw tooth socket (Somervell, 1944) has not been observed. A deeply infiltrating lesion involving the floor of the mouth and a lesion attached to or involving the mandible or maxilla have been regarded as indications for a combined mouth and neck dissection usually with preliminary irradiation to the mouth lesion. It is possible that this view may be modified following experience with megavoltage therapy, but until this has been clearly demonstrated surgery must play an important part in the initial control of such lesions. Whatever method of radiotherapy is used it is essential that inability to control the primary lesion is recognized at an early date, so that adequate radical surgery can be undertaken. Control of the primary lesion by a radon implant is apparent within six weeks and if failure is evident diathermy excision of the lesion combined with a radical neck dissection is carried out forthwith.

#### Recurrence

It is essential that recurrences be differentiated from radionecrosis and from new tumour formation in a neighbouring area in the mouth cavity. Other new primary lesions may develop in the mouth at some distance from the site of the initial lesion and such lesions have been seen in 5 per cent. of cases (Ledlie and Harmer, 1950, 3.7 per cent.; Southwick *et al.*, 1958, 11.2 per cent.), one patient having developed four different primary lesions. These tumours are usually recognized early because of an adequate follow-up and they present no special problems in treatment by radiotherapy.

The differentiation of radionecrosis from recurrence presents some difficulty. The aid of a skilled pathologist, the examination of repeated biopsy specimens and a close follow-up of the patient is essential. Radionecrosis is treated by diathermy excision of the involved area with or without removal of bone and operation needs to be repeated as necrosis spreads. In the past considerable bone loss has often resulted. A recurrent lesion necessitates a combined mouth and neck dissection, as to delay the treatment of recurrence following radiotherapy for any length of time is to be faced with an uncontrollable lesion.

It is necessary to follow patients over many years as further lesions may develop at or near the site of previous irradiation at intervals which may extend over 10 to 15 years. The early detection of these recurrences and prompt diathermy excision with a radical neck dissection if this has not previously been carried out usually results in continued control.

#### Palliation

It is unfortunately true that many patients have presented for treatment with an advanced lesion, often with associated lymph node metastases, so that palliative treatment only could be undertaken. The lesion in the mouth rapidly, and perhaps fortunately, results in death from haemorrhage, malnutrition and pneumonia. The lesion has often spread to involve the bone, and when skin involvement occurs a buccocutaneous fistula is inevitable. The most satisfactory palliation is growth restraint irradiation repeated at intervals since this lessens the size of the lesion in the mouth without producing massive necrosis with an increase in size of any fistula. Diathermy excision of most of the lesion with coagulation of the resulting raw area also produces a smaller mouth lesion, lessens infection, relieves pain and renders life tolerable. The use of blood transfusions, antibiotics, a high protein, caloric and vitamin diet and local mouth toilets with a zinc peroxide paste (Beckstrand, 1948) all improve the sense of well-being. Difficulty in swallowing necessitates nasal feeding and obstruction to the airway demands a tracheostomy.

The relief of pain has, in the past, been a major problem. Alcohol injection into the mandibular or maxillary nerve, division of the inferior dental and lingual nerves and division of upper cervical posterior nerve roots have been carried out, often with disappointing results. The development of a potent, non-specific respiratory stimulant in Melbourne in 1955 (Shulman *et al.*) has rendered pain control in incurable cancer effective. This drug, D.A.P.T. (2 : 4-diamino-5-phenylthiazole hydrobromide or hydrochloride), marketed under the name of daptazole, when used with morphia greatly reduces the risk of respiratory depression and prevents the temperament changes usually observed in morphia-dependent patients. A 20 mgm. tablet is given every six hours and this dose is gradually increased to 40 mgm. as the dose of morphia increases. It is necessary to omit the evening dose of daptazole to prevent undue wakefulness. Pain control is achieved and even with large doses of morphia there is no respiratory depression and the patient is able to interest himself in his surroundings so that an incurable cancer patient need no longer remain

“Unrespected, unpitied, unrepreved  
Ages of hopeless end.”

—John Milton.

### CERVICAL LYMPH NODE METASTASES

It is generally accepted that excision of the cervical lymph field is the correct treatment when metastases develop, radiotherapy being reserved as a palliative treatment in bad risk patients and when patients present with extensive involvement of the neck by spread of tumour through the lymph node capsule into the surrounding tissues, particularly with involvement of the carotid arteries. Since the operation of radical neck dissection carries a low mortality even in the elderly, surgery is rarely contra-indicated and that this is so is due considerably to the help of the anaesthetist and the resuscitation officer. In 106 personal radical neck dissections and combined mouth and neck dissections there have been three operative deaths, a mortality of 2.8 per cent. (Barclay *et al.*, 1951, 3.1 per cent.; Hendrick and Ward, 1952, 1.5 per cent.). One death occurred on the 15th day from a massive cerebral haemorrhage after a combined mouth and neck dissection, one was due to an unrecognized rupture of the spleen at operation and the third occurred from oedema of the glottis following a radical neck dissection on the contralateral side.

Operation is normally indicated when metastases become clinically apparent, provided always that the primary lesion has been controlled and there are no distant metastases. It is usual to regard a node of greater than 1 cm. in diameter as significant if there is no uncontrolled inflammatory element present in the primary growth area or in adjacent tissues. Usually an involved node is hard, but since metastases of squamous epithelioma readily undergo necrosis upon increase in size, an involved node may be soft and has even been mistaken for an abscess.

#### Accuracy of clinical diagnosis of node metastases

To determine the accuracy of clinical diagnosis of lymph node metastases epithelioma, not only of the mouth, but also of the lips and of the skin of the face, has been considered. In 93 personal patients, 64 suffered from epithelioma of the mouth, lips and face and 77 neck dissections have been carried out in this group. In 60 operations the nodes were regarded as clinically significant and, following histological examination, this diagnosis was proven to be wrong on nine occasions giving an accuracy of clinical interpretation of 85 per cent. In 17 operations the nodes were regarded as not significant and prophylactic dissections were carried out. Following histological examination metastases were detected in two cases giving an inaccuracy figure of 12 per cent. The accuracy of clinical observation of cervical lymph node metastases as indicated by various authors is shown in Table 2.

Ten of the prophylactic dissections were carried out because of the size of the primary lesion, delay in diagnosis or recurrence, three were

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TABLE 2  
LYMPH NODE INVOLVEMENT

Author	Percentage metastases present	
	Palpable nodes	Impalpable nodes
Simmons (1931)	55 (22 cases)	34 (20 cases)
Morrow (1937)	52 (48 cases)	39 (18 cases)
Tailhefer (1952)	66 (182 cases)	43 (244 cases)
Kremen (1956)	64 (11 cases)	43 (21 cases)

because of some doubt concerning the node which however was not regarded as significant, two were part of a combined mouth and neck dissection and two were the result of operation on the contralateral side of the neck in the presence of a near midline primary lesion because of



Fig. 3. Photograph of a completed left radical neck dissection showing : (1) the lingual nerve indicated by a dissector with the hypoglossal nerve a short distance below, (2) the carotid arteries, and (3) the cut surface of the parotid salivary gland.

proven involvement on the first operated side. The inaccuracy figure of 12 per cent. is not regarded as sufficiently high to warrant unrestricted prophylactic neck dissection and adequate follow-up will detect node involvement accurately and early.

#### The technique of radical neck dissection

The dissection of the lymph field in the neck is an extensive one and all lymph nodes are removed from the horizontal portion of the mandible and the mastoid mandibular fossa above to the clavicle below and from the midline of the neck anteriorly to the anterior border of the trapezius muscle posteriorly. The lymph nodes are removed in a block of tissue which contains the sternomastoid and digastric muscles, the internal and

#### SURGERY IN CANCER OF THE MOUTH

external jugular veins, the submandibular salivary gland, a greater or lesser portion of the parotid salivary gland and the spinal accessory and superficial cervical nerves (Fig. 3). The accessory nerve is not preserved since many lymph nodes bear a close relationship to it and there has been minimal disability resulting from paralysis of the trapezius muscle (Eddey, 1954), although Tailhefer (1952) advises preservation of the nerve to avoid "the crippling disability of trapezius muscle paralysis". Ward and Robben (1951) also advise preservation of the nerve to prevent postoperative pain from shoulder drop, but again this has not been a problem in this series. A tracheostomy is never necessary unless the contralateral side of the neck is operated upon at a second stage and the internal jugular vein is removed on both sides, when oedema of the glottis may occur. Thirteen staged bilateral dissections have been carried out and on four occasions both internal jugular veins have been removed. Following removal of both veins there has been considerable oedema of the face which has taken some time to settle down. That this occurs eventually indicates that the vertebral venous plexus is sufficient to provide for the entire drainage of blood from the head (Gius and Grier, 1950).

It is not proposed to discuss in detail the technique of routine radical neck dissection, except to mention certain aspects which ensure safe surgery and rapid convalescence. The skin flaps can be reflected with minimal loss of blood, provided a solution of adrenalin 1 in 250,000 is infiltrated under the flaps. The remainder of the operation is not accompanied by much blood loss since all vessels are divided under direct vision and appreciation of neck anatomy allows sharp dissection and tidy surgery. Elevation of the head and shoulders (Crile, 1906) prevents venous congestion and also lessens blood loss. Mobilization of the hypoglossal nerve as it turns forward across the carotid arteries is the key procedure to dissecting in the upper neck, and removal of the posterior belly of the digastric muscle allows dissection of the mastoid mandibular fossa with division of the internal jugular vein as it leaves the jugular foramen. Institution of sealed underwater drainage evacuates air and blood from beneath the skin flaps, produces adherence of the flaps to the underlying muscles and tissues and results in rapid wound healing, so that the patient can often leave hospital in five to seven days.

The complications of this procedure are negligible. Paralysis of the lower face results if the marginal mandibular branch of the facial nerve is divided, but this can be avoided by mobilizing this nerve early in the dissection. The thoracic duct can usually be visualized low down in the neck on the left side (Fig. 4) and any damage to this must be detected so that the duct or its tributaries can be ligated. A lymph leak is often difficult to stop in the postoperative period, but eventually does so following repeated aspiration, firm pressure dressings and a fat-free diet. Although portion of the parotid salivary gland is removed, salivary

fistula does not occur. Chylothorax (Frazeel *et al.*, 1951), pneumothorax or pneumomediastinum (Aitken and Smith, 1953) have never resulted.

#### Recurrence in the neck

Recurrence in the neck after adequate neck dissection results from division of involved lymphatics. Such involvement may result from spread to one or more lymph nodes from the primary tumour by permeation rather than by embolism or by spread through the capsule of an involved node into the surrounding tissues and lymphatics. That neck recurrences do not occur more frequently is due to early operation when

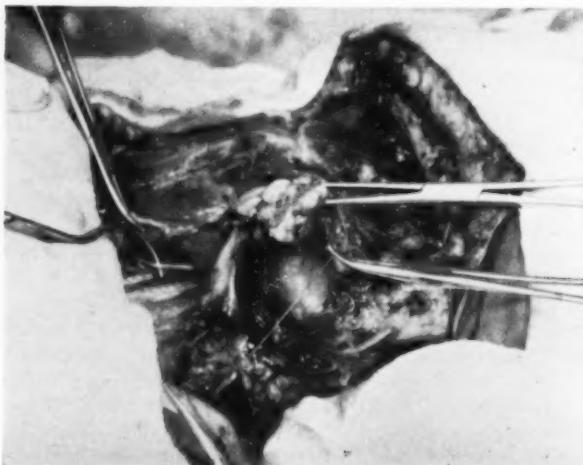


Fig. 4. Photograph of a left radical neck dissection after division of the structures at the root of the neck showing : (1) the left jugular lymph trunk held by artery forceps, (2) the phrenic nerve indicated by a dissector, and (3) the accessory nerve held by a ligature.

a cervical node metastasis is detected and to the common method of spread from the primary tumour to the nodes being by embolism (Willis, 1953), since in most cases the tissues between the primary tumour and the lymph field in the neck have not been adequately treated either by the radiotherapist or by the surgeon. This area may now be treated more adequately by megavoltage therapy as part of the treatment of the primary lesion.

The development of a recurrent lump in the neck after a neck dissection presents some problems. It is difficult to be sure of the significance of such a lump and it is of value to consider the time at which definite neck

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recurrences occurred in this series of 77 neck dissections. There have been six neck recurrences, all of which occurred within a few months after completion of the neck surgery, the longest period being 10 months (Eddey, 1958). However, not all lumps developing in the neck are recurrences and in two cases excision proved the swelling to be a granuloma around a suture, in two cases a neuroma and in one a localized calcification of the bifurcation of the common carotid artery.

Neck recurrence occurs early and is usually detected in one of three areas. Commonly the first swelling appears around the bifurcation of the common carotid artery and, by the time the condition is recognized, involvement of the artery has occurred and any form of treatment will fail. Radiotherapy is likely to result in skin necrosis and massive secondary haemorrhage from the underlying involved carotid arteries with a fatal result. Diathermy excision requires removal of the carotid arteries at the bifurcation and leads to hemiplegia. At present there seems no likelihood of replacing the carotid artery with a graft in the presence of recurrent lesions in the neck. If the recurrence occurs more anteriorly in the muscles of the floor of the mouth and in the upper neck above the hyoid bone, radical diathermy excision may well control this and has been carried out with temporary success in three patients. The third common situation of recurrence is inferiorly in the lower cervical lymph nodes which have been left following an incomplete neck dissection. Such recurrent lymph node involvement should be treated surgically, although control is unlikely.

#### COMBINED MOUTH AND NECK DISSECTION

In 1946, Sugarbaker and Gilford described 12 cases of extended neck dissection with removal of portion of the mandible with two deaths. Kremen in 1951 performed 12 operations with division of the mandible for access with no deaths, Slaughter and Southwick (1952) described 14 cases with preservation of the mandible, Ward and Robben (1951) described 45 composite operations with removal of portion of the mandible with eight hospital deaths (a mortality of 18 per cent.) and Pollack, in 1955, described the composite operation on 23 patients, 16 with positive lymph nodes, with two postoperative deaths. Butler and Harrigan, in 1957, described 12 patients of whom eight had epithelioma of the floor of the mouth and one of the tongue where the pull through *en bloc* procedure was carried out. Alford and Klopp (1958) reported on 29 patients on whom they had excised the primary lesion to include portion of the inner table of the mandible with a neck dissection if the nodes were positive. Twenty patients were followed for three years and 11 for five years and of these 15 and 7 patients respectively were alive and free from cancer. Morfit (1959) described 58 combined (commando) operations for mouth cancer between 1948 and 1955, with four operative deaths and 46.3 per cent. three-year survival.

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These reports appearing in the literature indicating a low mortality, an acceptable deformity and an increased cure rate encouraged an increased surgical attack on carcinoma of the mouth, and experience of the composite operation has been of 18 patients, some of whom have been treated in conjunction with Dr. R. Kaye Scott, who has directed the radiotherapy programme. We have considered that preliminary external irradiation of the mouth lesion to delineate the tumour and control the spread in the mouth followed in a few weeks by a combined mouth and neck dissection will give good immediate results and be accompanied by little mortality or morbidity. There has been one death (mortality 5.5 per cent.) which occurred on the fifteenth postoperative day from cerebral haemorrhage shortly before the patient was due to go home. Healing of the mouth and neck has presented some problems which will be discussed, but the use of preliminary irradiation has not appeared to effect to any extent the healing process in the mouth or neck. Whether the approach to these cases will be affected by megavoltage therapy to the primary lesion and related tissues of the floor of the mouth and upper neck remains to be seen, but at present the following are considered to be the indications for a combined mouth and neck dissection for mouth epithelioma:

- (1) When the tumour spreads from the tongue or the floor of the mouth to be attached to or invade the mandible.
- (2) When the tumour spreads from the mucosa of the cheek or the palate to invade the maxilla.
- (3) When the tumour infiltrates through the mylohyoid muscle into the submandibular region.
- (4) When an infiltrating tumour of the tongue or the floor of the mouth has cervical metastases present when the patient first presents for treatment.
- (5) When the tumour fails to respond to or recurs following radiotherapy.
- (6) When the tumour is associated with extensive leukoplakia or mouth oedema.

No *en bloc* pull through procedure with preservation of the mandible as described by Slaughter and Southwick (1952) and by Butler and Harrigan (1957) has been performed, because rarely does a tumour of the floor of the mouth or tongue present with metastases at a period when there is a satisfactory margin of uninvolved mucosa between the edge of the tumour and the mandible. The necessary manipulation to remove such a tumour without disturbing the mandible does not appear to be the best cancer surgery. The operations carried out have been mainly excision of the primary lesion with portion of the mandible in continuity with the cervical lymph nodes and less commonly excision of the primary

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lesion with the lymph nodes by division of the mandible for access followed by reconstruction. Tracheostomy is rarely necessary and has only been used when the symphysis of the mandible has been excised, thus detaching the genioglossus muscles and allowing the remaining portion of the tongue to fall back to occlude the glottis. Provided the symphysis remains intact, the tongue remains in the mouth and obstruction to the airway does not occur. At no time has a gastrostomy (Kremen, 1951) been performed, as healing in the mouth has been rapid and an indwelling Ryle tube passed through the nose together with intravenous infusions has been enough to ensure proper fluid replacement and adequate nourishment.

The operation is an extensive one and, since it is normally performed on elderly patients, adequate preoperative treatment to the respiratory and cardiovascular systems is imperative and a short course of physiotherapy treatment is essential. The cooperation of a competent anaesthetist to provide anaesthesia by a nasal tube and of a resuscitation officer to control fluid and blood replacement is necessary. A Ryle tube is passed into the stomach through the nose before operation.

Preliminary infiltration with a solution of adrenalin hydrochloride 1 in 250,000 under the skin flaps and elevation of the head and shoulders of the patient by adjusting the operation table makes blood loss during elevation of the skin flaps minimal. A sponge rubber pillow under the patient's heels prevents pressure on the calf muscles and this may lessen the likelihood of phlebothrombosis during the operative procedure, which may last two and a half to three hours.

#### The neck dissection

The incision commences over the mastoid process and passes forwards below the angle of the jaw to the opposite side of the point of the chin. From the midpoint of this collar incision a vertical incision passes downwards to cross the clavicle just posterior to the clavicular insertion of the sternomastoid muscle. The skin flaps are elevated with the underlying platysma and this is particularly necessary when preoperative radiotherapy has been given (Martin *et al.*, 1951). The flaps are reflected and it has not been necessary to carry the incision upwards in the midline to split the lower lip (Ewing, 1954; MacFee, 1959), as entry into the mouth is readily obtained by reflecting the skin upwards over the symphysis and body of the mandible.

The dissection commences low in the neck by division of the sternomastoid and omohyoid muscles, the external and internal jugular veins, the supraclavicular nerves, the accessory nerve and the fat in the posterior triangle. The tissues are reflected cranially from the muscles of the posterior triangle and the cutaneous nerves arising from the cervical plexus are divided as they appear at the lateral border of the scalenus anterior muscle. The superior belly of the omohyoid muscle is divided

anteriorly and the external carotid artery is ligated at its origin. The hypoglossal nerve is freed by division of the occipital artery and the nerve is then mobilized upwards and forwards. The nerve is only preserved if the dissection is not to remove a considerable portion of the tongue. The submandibular duct is divided and the anterior and posterior bellies of the digastric muscle are lifted up with the dissected neck tissues.

#### The mouth dissection

The upper skin flap is dissected from the body of the mandible as far forward as the symphysis. The anterior belly of the digastric muscle is detached from the mandible and a pair of forceps passed upwards on the undersurface of the bone through the mylohyoid muscle. The mandible



Fig. 5. Photograph of an X-ray showing involvement of the right half of the body of the mandible and its alveolar canal.

is then divided 1 cm. lateral to the symphysis with a Gigli saw. If the mandible is to be preserved two holes symmetrical on each side of the point of division are drilled so that wires can be inserted at the end of the operation to reconstitute the bone. The exact site of division of the bone when a portion of it is to be removed is determined by the extent of the mouth tumour and of the bone involved. If the tumour is situated anteriorly in the floor of the mouth then the symphysis is removed and this necessitates a tracheostomy. In all cases with bone involvement the point of division of the mandible must be anterior to the mental foramen so that the length of mandible in which the alveolar canal lies may be removed. This is important as spread may occur rapidly along

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this canal which, in the elderly edentulous patient with an atrophic alveolus, may lie close to the mouth mucosa (Fig. 5). Following division of the mandible anteriorly the two surfaces of the divided bone are spread apart to allow adequate access to the mouth cavity.

When the mouth dissection is for soft tissue removal, the next step is to divide the mylohyoid muscle and its overlying mucosa at their attach-



Fig. 6. Photograph of a specimen removed following a combined mouth and neck dissection by dividing the mandible for access showing the lateral half of the tongue and floor of the mouth in continuity with the dissected tissues from the neck.

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ment to the mandible to free the tongue and the floor of the mouth from the bone. The diathermy needle is then passed downwards through the tongue from its dorsal surface to the floor of the mouth well clear of the carcinoma, the amount of tongue removed depending on the extent of the growth. As it is often difficult to see or feel the extent of involvement an adequate margin must be taken and the tissue removed should include the whole of any previously irradiated area. The dissection proceeds posteriorly as far as is necessary and is then carried inferiorly towards the submandibular region so that the tongue and its associated muscles are removed. The excised portion of the tongue and floor of the mouth containing the carcinoma is then in continuity with the tissues which have been elevated by the neck dissection up to the submandibular region and is completely free from the mandible (Fig. 6).



Fig. 7. Photograph of the operation for removal of the right parotid salivary gland showing the branches of the facial nerve.

Where the mouth dissection is designed to remove a carcinoma in the floor of the mouth, together with portion of the involved mandible, the procedure is somewhat different. The mucosa of the cheek is incised backwards from the point of division of the mandible to its ramus. The mucosa at the edge of the tongue is then divided well medial to the growth and this incision is carried downwards clear of the growth on the medial side. The dissection continues inferiorly to divide the tongue muscles and to incorporate in the dissected tissue the digastric, hyoglossus and mylohyoid muscles. The incision is then carried well posterior to the growth and through the mucosa covering the inner aspect of the ramus of the mandible above the lingula to divide the medial pterygoid muscle,

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the inferior dental vessels and nerve and the lingual nerve. When this has been done the ramus of the mandible must be exposed laterally. This is achieved by removal of a greater or lesser portion of the parotid salivary gland. Where the tumour in the mouth lies posteriorly so that the parotid lymph nodes may be involved, removal of the parotid salivary gland must be carried out before the ramus of the mandible is divided.



Fig. 8. Photograph of a specimen removed following a combined mouth and neck dissection showing the mandible, involved by tumour, in continuity with the dissected tissues from the neck.

The facial nerve is exposed as it enters the gland just below the inner end of the cartilage of the external auditory meatus. By exposing the nerve and following it forwards the parotid salivary gland can be dissected free from the nerve and the branches, with the exception of some from the cervicofacial division, preserved (Fig. 7). This avoids paralysis of the orbicularis oculi muscle, which, if it occurs, produces a troublesome disability only partially controlled by lateral tarsorrhaphy. The lateral side of the ramus of the mandible is cleared and the bone divided above

the lingula and usually just below the mandibular notch with a Gigli saw. If the degree of involvement of the mandible warrants, the whole of one half of the mandible or more can be removed by disarticulating the bone at the temporomandibular joint. When the mandible has been divided the dissected portion of the mandible and associated floor of the mouth containing the carcinoma is in continuity with the tissues already dissected in the neck up to the submandibular region (Fig. 8).

The dissection is completed by clearing the mastoid mandibular fossa. When portion of the mandible has been removed access to this fossa is excellent so that the dissection proceeds cranially to separate the internal

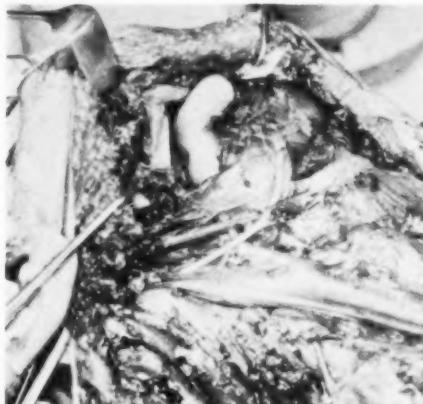


Fig. 9. Photograph of a right combined mouth and neck dissection with removal of portion of the mandible showing: (1) a bone hook holding forwards the divided mandible near the symphysis, (2) the tongue and the divided cheek mucosa, (3) the parotid salivary gland indicated by a probe, (4) the carotid arteries and the vagus nerve, and (5) the hypoglossal nerve turning forwards across the carotid arteries onto the hyoglossus muscle.

jugular vein from the internal carotid artery and the vein and the accessory nerve are divided as they emerge from the jugular foramen. The sternomastoid and digastric muscles are divided at their bony attachments (Fig. 9). When portion of the mandible has not been removed the dissection of the mastoid mandibular fossa is carried out by retraction of the mandible forwards. Removal of the posterior belly of the digastric muscle and division of the external carotid artery allows access to this fossa and the dissection can be carried out to the base of the skull.

#### **Wound closure**

When the mouth dissection has not involved removal of portion of the mandible, reconstitution is accomplished easily by insertion of wires

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through the drill holes made previously, thus opposing the divided bone and reconstituting it. The soft tissue repair is most easily carried out if the mucosa covering the inner aspect of the mandible is mobilized to free the mucosa lining the cheek. This allows the mucosa to be brought medially and opposed to the cut mucosa of the tongue. Sutures of chromic catgut are inserted so that the knots are tied on the deep surface. This mucosal apposition between the cheek and tongue is accomplished with some difficulty particularly anteriorly where the tongue is attached to the mandible.

When a portion of the mandible has been removed the cheek mucosa is sutured to the divided tongue. Difficulty may be experienced posteriorly

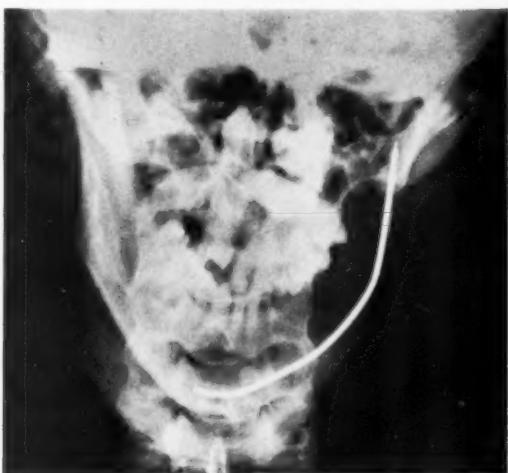


Fig. 10. Photograph of an X-ray showing the wire used to hold apart the two cut surfaces of the mandible.

where mobility of lateral mucosa cannot be obtained and to a lesser extent anteriorly depending on how far forward the bone has been divided. To enable healing to occur readily the two cut surfaces of the mandible are kept in position by the insertion of a stout piece of Kirschner wire placed into each cut end (Fig. 10). This manoeuvre enables the point of the chin to maintain its central position and this method has been used by others (Conway and Murray, 1953; Byars, 1954). No attempt is made to reconstitute the mandible by insertion of either a bone graft or a vitallium prosthesis (Conley, 1951) at this stage. Tissue is rarely available between the mouth and the skin flaps to cover adequately such a graft or prosthesis.

After reconstitution of the floor of the mouth and either suture of the divided mandible or insertion of a stout wire to maintain correct position of the cut surfaces of the mandible after excision of portion of that bone, the skin wounds are closed. This is easy, provided that skin has not been excised because of its involvement by tumour. Removal of neck or face skin may necessitate a plastic procedure for wound closure (King, 1956) and this has been carried out on three occasions. Underwater seal drainage is applied so that the skin flaps adhere quickly to the muscles and other tissues. On no occasion has the cheek been split nor has it been necessary to use a split skin graft to replace the mucous lining of the mouth (Edgerton, 1951), as reconstitution is usually easy and, if not, the cavity left granulates and is covered quickly by mucosa. It is essential to obtain primary skin healing to prevent a postoperative buccocutaneous fistula.

Where the lesion involves the mucosa of the cheek or the palate and there is maxillary bone involvement the procedure is carried out in two distinct stages either separated by two or three weeks or at one operation. A radical neck dissection is performed in the normal manner and the mouth is entered above the body of the mandible by reflecting the upper skin flap cranially. The involved tissues of the upper part of the mouth are removed by diathermy without consideration to normal anatomical structures. It is not possible to close this mouth wound, but it granulates rapidly, becomes covered with mucosa and the cavity is readily filled later by a dental prosthesis.

#### **Postoperative management**

With extensive oral procedures the patient is unable to swallow and it is necessary to provide nourishment through a nasal tube. This is withdrawn as soon as the patient can swallow, as bronchopneumonia develops readily after these operations in elderly people. Frequent saline mouth toilets are carried out and the patient is requested not to talk and not to move the tongue more than necessary. Despite meticulous suture and the mobility of the cheek mucosa, it is common to find the tongue breaking away anteriorly where it is sutured to the mucosa of the lower lip or posteriorly where it is attached to the mucosa in the region of the divided mandible. The resulting cavity does not communicate with the exterior, provided the skin wound does not break down and the flaps adhere to the underlying muscles, and this occurs following underwater seal drainage. The cavity is not painful and it heals rapidly in two or three weeks. However, if both skin and mucosal sutures give way a buccocutaneous fistula develops. This is not closed until some weeks later, by which time the mouth and skin wounds have healed, the fistula is small and closure is readily obtained by mobilizing skin and mucosa and suturing each meticulously.

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Serum collection does not often occur with underwater seal drainage, but sometimes fluid must be aspirated from beneath the lower part of the posterior skin flap. Occasionally this becomes infected and requires drainage. Osteomyelitis may develop in the end of the divided bone and this necessitates removal of the diseased bone.

The patient finds some difficulty in speaking for a time after these radical procedures, but despite removal of portion of the tongue and of the mandible, speech ability often returns to near normal. Where the

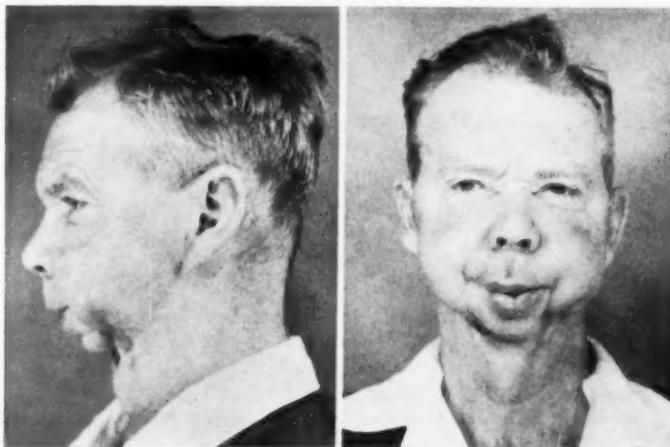


Fig. 11. Photographs of a patient showing the deformity which has resulted from removal of the symphysis for an epithelioma of the floor of the mouth involving the bone which failed to respond to radiotherapy from a linear accelerator.

symphysis has been removed drooling occurs, but this can be helped by the exhibition of appropriate drugs. The patient is made ambulatory as early as possible to improve his sense of well-being.

#### Jaw reconstruction

The deformity following removal of portion of one half of the mandible, provided that the symphysis is left intact, is minimal and it must be rare that a bone graft is required in the elderly patient who has undergone this procedure. A bone graft has been carried out later only in one case in this series. The wire used to maintain separation of the two cut surfaces of the mandible rarely stays in place for more than a few months and it is then removed. Its presence enables sound healing of the mouth and neck to occur and keeps the symphysis in a central position.

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The situation is somewhat different when the symphysis is removed as loss of the chin results in considerable deformity (Fig. 11). However, before carrying out extensive plastic procedures, control of the lesion must be assured. It is open to question whether extensive staged plastic reconstruction procedures are indicated in these elderly people as the discomfort of these procedures may well be greater than the disability the patient has from his deformity. Following control of the mouth lesion there is no pain, the patient eats and speaks satisfactorily and soon adjusts his life to live with himself and his fellow men. Free skin grafting within the mouth after mobilizing freely the distorted scar of the tongue and mouth floor and the immediate use of an acrylic prosthesis to maintain normal contour (Figi and Masson, 1953) has not been undertaken.

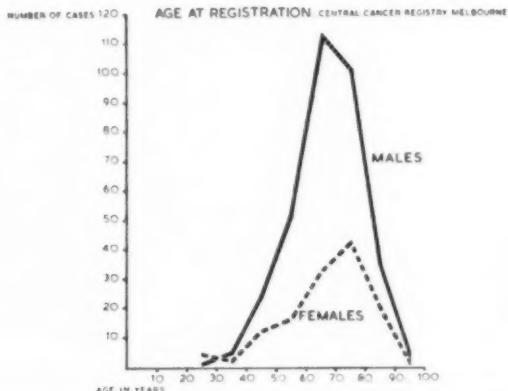


Fig. 12. Graph showing the age distribution of patients with epithelioma of the mouth at the time of registration by the Central Cancer Registry.

### RESULTS OF TREATMENT 1946-1958. 457 PATIENTS CENTRAL CANCER REGISTRY, MELBOURNE

The records of 457 patients in whom a diagnosis of epithelioma of the mouth has been made in the major metropolitan hospitals in Melbourne contributing to the central cancer registry, for a 13-year period from 1946, have been reviewed. It has been necessary to exclude 62 of these patients since they had been treated previously outside the group of contributing hospitals. The site of the primary lesion and the sex ratio of the remaining 395 patients is shown in Table 3 and the age distribution in Figure 12.

Because of debility, senility, advanced cardiovascular or pulmonary disease, general metastases or advanced local disease some patients

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TABLE 3

<i>Site of the primary lesion (395 patients)</i>		<i>Sex ratio</i>
Tongue (anterior two-thirds)	173	M/F = 2.4
Palate (hard and soft)	50	M/F = 4.6
Cheek and Floor	172	M/F = 2.4

could not be given more than symptomatic treatment and in others the local disease and the cervical lymph node involvement was such that palliative X-ray therapy only seemed indicated. The remainder were given radical treatment directed to cure of the disease and the number involved in each group is shown in Table 4.

TABLE 4  
TYPE OF TREATMENT IN 395 PATIENTS

Radical treatment	276	Tongue .. .. ..	128
		Palate .. .. ..	31
		Cheek and Floor .. .. ..	117
Palliative treatment	89	Tongue .. .. ..	41
		Palate .. .. ..	14
No treatment	30	Cheek and Floor .. .. ..	34

The three-year and the five-year survival rate in the 276 patients whose treatment was directed to cure is 36.2 per cent. and 20.9 per cent. respectively and is shown in Table 5. Five patients only are untraced, four at five years and one at three years, and although these were well when last examined, their ultimate fate is unknown and they have been counted as dead.

TABLE 5  
RESULTS OF TREATMENT IN 276 PATIENTS

<i>Site of the primary lesion</i>	<i>Number of cases</i>	<i>Three-year result</i>	<i>Number of cases</i>	<i>Five-year result</i>
		<i>Percentage alive</i>		<i>Percentage alive</i>
Tongue .. .. ..	88	37.5	77	22.1
Palate .. .. ..	23	39.1	18	16.7
Cheek and Floor .. .. ..	66	33.3	53	20.8
<b>TOTAL</b> .. .. ..	<b>177</b>	<b>36.2</b>	<b>148</b>	<b>20.9</b>

In 177 patients (tongue 79, palate 28, floor and cheek 70) definite treatment was given to the primary lesion only, either by radiotherapy (152 patients), by surgery (14 patients) or by combined surgery and radiotherapy (11 patients). Some of the patients whose primary lesion was treated by radiotherapy were given external irradiation or a radon implant for suspected, but unproven, cervical metastases. The five-year result in this group of 177 patients is 15.0 per cent. (tongue 16.3 per cent., palate 18.8 per cent., floor and cheek 11.4 per cent.).

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In 99 patients (tongue 49, palate 3, floor and cheek 47) the cervical lymph nodes were dissected and in this group the primary lesion was treated by radiotherapy in 49 patients, by surgery in 25 patients and by combined surgery and radiotherapy in 25 patients. The five-year result in this group is 33.3 per cent. (tongue 32.1 per cent., palate 0.0 per cent., floor and cheek 38.9 per cent.). When the excised lymph nodes were found to be histologically involved (50 patients) the five-year result is 25.9 per cent. (tongue 18.8 per cent., palate 0.0 per cent., floor and cheek 40 per cent.). When the nodes were not histologically involved (49 patients) the five-year result is 42.9 per cent. (tongue 50.0 per cent., palate 0.0 per cent., floor and cheek 37.5 per cent.). These results are illustrated in Table 6.

TABLE 6  
EFFECT OF LYMPH NODE DISSECTION

Classification	Total number of cases	Three-year result		Five-year result	
		Number of cases	Percentage alive	Number of cases	Percentage alive
Overall result ..	276	177	36.2	148	20.9
Without lymph node dissection ..	177	123	31.7	100	15.0
With lymph node dissection ..	99	54	46.3	48	33.3
Lymph nodes negative histologically ..	49	23	52.2	21	42.9
Lymph nodes positive histologically ..	50	31	41.9	27	25.9

The treatment of 25 (tongue 15, floor 10) of the 99 patients in whom the cervical lymph nodes were excised consisted of a combined mouth and neck dissection often with preliminary radiotherapy to the primary lesion. Histological examination of the excised nodes in this group proved positive in 11 patients. Seventeen of these patients (47 per cent. positive nodes) are available for a three-year follow-up and of these nine (44 per cent. positive nodes) are alive, whilst 16 patients (50 per cent. positive nodes) are available for a five-year follow-up and of these six (50 per cent. positive nodes) are alive. Of 89 patients given palliative treatment alone, 75 are available for a three-year follow-up and five are alive (6.7 per cent.), whilst 51 are available for a five-year follow-up and four are alive (7.8 per cent.).

The cause of death in most patients was an uncontrolled or recurrent primary lesion or a recurrence in the neck. Ten patients died from causes unrelated to their primary lesion and eight died following a neck or a combined mouth and neck dissection. Distant metastasis was an uncommon cause of death, only six patients (1.5 per cent.) having metastases present at registration and 32 (8.2 per cent.) developing these during

#### SURGERY IN CANCER OF THE MOUTH

the follow-up period. The outcome of treatment is decided early, since, of the 395 patients reviewed, 46.7 per cent. died in the first year and 63 per cent. died before the end of the second year following completion of treatment. The survival rate of these 395 patients is illustrated in Figure 13 and this rate is compared with the probability of survival of the Australian population at the age of 62 years, which is the average age of all cases in this series at registration.

When one reflects upon these results it is apparent that epithelioma of the mouth is not a common disease, that its frequency has diminished in men over the last three decades, that it occurs in the elderly at an average age when life expectancy is still high, that the five-year survival rate is low and that in the majority of patients death occurs within the

#### EPITHELIOMA OF THE MOUTH

A. PROBABILITY OF SURVIVAL (AUSTRALIAN POPULATION) AT AGE 62 YEARS  
B. SURVIVAL TIME OF THE 395 PATIENTS REVIEWED

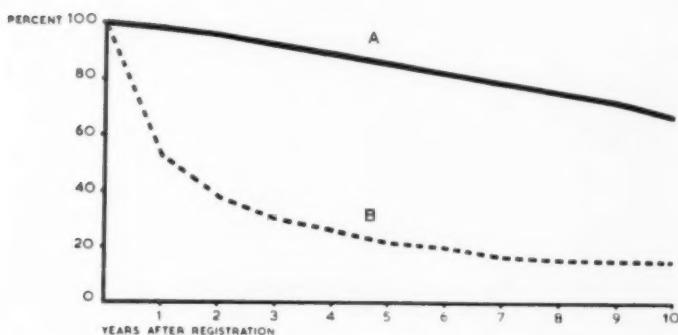


Fig. 13. Graph showing the survival rate of the 395 patients reviewed and the probability of survival of the Australian population at the age of 62 years.

first three years after completion of treatment. Death results most frequently from the effects of an uncontrolled or recurrent primary lesion, less frequently from the effects of recurrence in the neck and least frequently from the effects of distant metastases. Treatment of this disease is therefore largely a local problem so that every effort must be directed to achieve control of the primary lesion. There will always be some patients in whom treatment is not possible, but no patient should be regarded as suitable for palliative radiotherapy until the possibility of radical surgery has been considered.

Radiotherapy treatment alone has resulted in a low five-year survival rate in this series (approximately 15 per cent.), probably because little

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consideration was given in the early years to surgical treatment, due largely to a lack of interest by surgeons. Also the use of radiotherapy at times in the treatment of the cervical lymph field for suspected cervical metastases rather than the performance of a radical neck dissection has contributed to this low figure. When the cervical lymph nodes have been dissected the five-year survival rate is improved (33.3 per cent.) and is best if histological examination of the excised nodes proved negative (42.9 per cent.), although still low when the examination proved positive (25.9 per cent.). A neck dissection was carried out only if adequate control of the primary lesion had been achieved, or was expected to be achieved, at the time of the dissection, and this implies a selection of

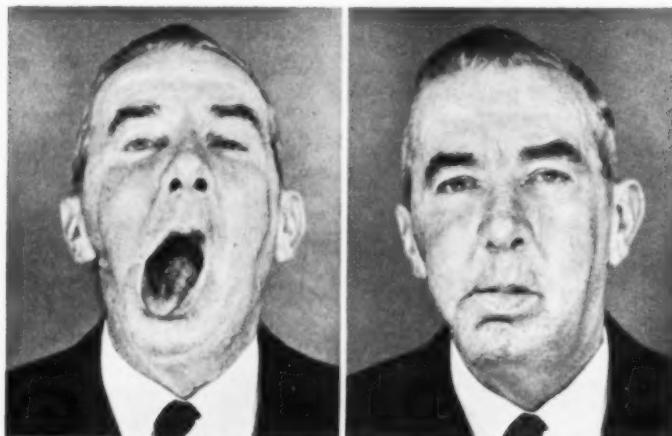


Fig. 14. Photographs of a patient following removal of the majority of the right half of the mandible lateral to the symphysis for an epithelioma of the floor of the mouth involving the bone showing the good cosmetic result.

patients. The best result must always occur when a neck dissection is carried out and examination of the nodes proves negative. Prophylactic neck dissection is indicated only in those patients in whom experience suggests that cervical metastases may develop. A large infiltrating undifferentiated primary lesion demands such a dissection as does the presence of cervical metastases from a midline or near midline lesion demand a contralateral dissection.

Favourable results (37.5 per cent. five-year survival with 50 per cent. of patients having positive nodes) have been achieved following combined mouth and neck dissections in a small group of patients (Ward *et al.*, 1959, 40 per cent. five-year cure). The mortality of this procedure is

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low, the morbidity is minimal, the deformity (unless the chin is removed) is negligible (Fig. 14) and speech and swallowing ability approach normal. Plastic reconstruction procedures are necessary if considerable skin involvement has occurred or in some cases following removal of the chin. However, elderly people who have suffered from this disease are well satisfied if they are without pain, are able to eat prepared food reasonably well and can speak intelligibly.

Our responsibility as surgeons must not be affected by the development of a new radiotherapy equipment and techniques (Churchill-Davidson *et al.*, 1957), as it is illogical to expect these procedures to produce significantly improved results although the patient may well receive his treatment in greater comfort and with less risk of radiation complications and side effects. Early diagnosis of the primary lesion and of its cervical lymph node metastases, education of the public and of the profession both medical and dental to ensure early treatment, the development of an interest in this disease by more surgeons, close liaison between surgeon and radiotherapist in the planning of treatment, the increased use of the combined operation and a close follow-up to detect early failure of control or recurrence of the primary lesion or the development of a new primary lesion will produce an improvement in the results of treatment of epithelioma of the mouth which is long overdue.

#### ACKNOWLEDGMENTS

I am most grateful to the Anti-Cancer Council of Victoria for the opportunity to review the records compiled by the central cancer registry from the case histories of patients treated for epithelioma of the mouth in the major metropolitan hospitals in Melbourne. Considerable help has been given by Dr. D. W. Rankin of the State Health Department and Miss C. J. McCall, B.Com. (MELB.), Statistician in charge of the registry, to ensure the accuracy both of the information relative to each patient and of the results. The advice and help of Dr. R. Kaye Scott has always been appreciated and many of his patients have been referred to me for the surgical phase of their treatment. The Audio-Visual Aids Department of the University of Melbourne (Director, Mr. Newman Rosenthal) prepared the graphs illustrated in Figures 1, 2, 12 and 13, from information supplied by the Central Cancer Registry and by the Commonwealth Statisticians Department. The photographs are the work of Mr. R. Inglis, Clinical Photographer at the Royal Melbourne Hospital, and his help has been invaluable. Finally I wish to pay tribute to Sir Gordon Gordon-Taylor, who first stimulated my interest in this disease and to whom, like many another Australian surgeon, I owe so much.

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#### SAYINGS OF THE GREAT

“The fact that no two blades of grass are precisely alike, still less two cases of disease, is the fallacy of all statistics which relegates them to the place of secondary or confirmatory evidence. The precise study of single cases is, in my opinion, of much greater value.”

W. Sampson Handley.

“Mere numbers of cases, however, mean little. It is what is done with the few that actually counts, and numbers, even though they add to personal experience, may in reality prove a handicap to the advancement of knowledge by absorbing the time which might otherwise be spent in assuaging curiosity.”

Harvey Cushing.

“Tradition, then, is something more than a mere legend of bygone happenings: it is a living leavening force influencing and determining conduct among members of a community. Tradition there may be, or there may be not, but where it is, it can move mountains or stem the fiercest torrent or flood. Age does not weaken it, nor the years condemn, but rather they enhance its power. It is not to be bought with silver or gold, but it is something handed down as an imperishable heritage, to be an inspiration for service—service, God's greatest gift to mankind.”

Sir Gordon Gordon-Taylor.

(Submitted by Professor Lambert Rogers, C.B.E., V.R.D., F.R.C.S.)

*Contributions are invited.*

DIFFUSE ULCERATIVE COLITIS AND ITS TREATMENT BY  
ILEO-RECTAL ANASTOMOSIS

Hunterian Lecture delivered at the Royal College of Surgeons of England

on

10th March 1960

by

S. O. Aylett, M.B.E., F.R.C.S.

Surgeon, Gordon Hospital and Metropolitan Hospital

THIS LECTURE IN the main records my personal experiences in the treatment of 131 consecutive cases of diffuse ulcerative colitis in which in every case my endeavour has been to retain the rectum, and, by anastomosing this to the ileum after total colectomy had been carried out, thus to restore a normal route of evacuation. The first of these cases concerned in this report was operated upon in March 1952, and the last in August 1959. Without exception every patient before being referred for surgery had been under medical care of varying duration and many by any standards were desperately ill. Excluding seven patients not included in this series because at the time of operation they had widely disseminated cancer, and two to be referred to later, no patient has been treated in any other way. That is not to say that certain of these cases may not have been served better had they been subjected to an immediate proctocolectomy with the institution of a permanent ileostomy, but our failures, as I think I will be able to show, have been few, and with the experience of past years behind us they are likely to be less in the future. We will be better qualified to select the small minority of patients suffering from this disease in whom the inevitability of an artificial stoma can be recognized at the commencement of treatment.

The cases in this series have been affected by a diffuse disease involving all regions of the large intestine including the rectum, though several have shown skip areas in which the mucosa has been but minimally involved. Usually, but I would emphasize by no means always, the disease has appeared at its worst in the pelvic colon, although whether this indicates that it has arisen in this region is difficult to prove. Certainly I cannot subscribe to the view expressed by Jones (1938) and Bacon and Vaughan (1949), amongst others, that the condition has its origin in the rectum in most cases and that it spreads backwards to involve the rest of the colon. In no single instance in this series has a patient been under treatment for a proctitis prior to the onset of the symptoms of widespread disease. The latter have commenced usually with dramatic suddenness. Moreover, included in the series is no case that would fall into the category of ileocolitis as defined by Brooke (1954) and none has been seen in our clinic.

## DIFFUSE ULCERATIVE COLITIS AND ITS TREATMENT

### Aetiology

There is little that can be said about the causation of the disease as this is unknown. Of all the theories that of a psychogenic origin is most popular. I myself would be hesitant to attribute its origin to this factor alone, for, although many patients have had emotional disturbances and are of an over-worrying type, on their return to good health they become perfectly normal individuals. Two of my patients had been diagnosed as schizophrenics, but both recovered completely following the cure of their intestinal disease. Moreover, it would be difficult even for the most ardent psychiatrist to suggest the intra-uterine mental upset that could account for the presence of the condition in the newborn. Such cases, one with perforation, have been reported by Beranbaum and Waldron (1952), by Hart (1946) and by Cabot (1942).

### Pathology

There are certain aspects of the pathology of the condition which are important in its surgical treatment and the first to which I wish to refer is to the diffuse nature of the disease. One sees patients who have failed to respond to medical treatment in whom the barium enema shows changes apparently limited to one or other side of the colon. Usually, it is the right side which appears free of disease. At operation this region may similarly appear normal on inspection and the case appears to be that of a regional colitis. The X-rays and the outward appearances of normality, however, are misleading and it has been our experience that if the condition of the patient is such that surgery is necessary for his or her cure, the disease has almost certainly involved all parts of the large intestine. The ulceration is patchy and confined to the mucosal layer only on the apparently normal side thus preventing its recognition, but, if the surgeon is tempted to carry out a hemicolectomy on these cases the hidden disease in the residual colon is prone to flare up soon after operation and to give rise to every symptom for which the patient underwent treatment. Figure 1 (a) shows the colon removed from such a patient in whom the X-ray and operative appearances were those of a left-sided colitis. Close examination of the apparently normal bowel (Fig. 1 (b)) shows the multiple and scattered ulcers with which it is affected. I have carried out a partial colectomy in four cases and regretted it in three. One died four months later of an overwhelming haemorrhage originating in the residual colon, two had recurrences of their symptoms and were converted into a total colectomy with ileo-rectal anastomosis and have continued since then in excellent health, and one alone remains fit. In the light of these experiences I think that where surgery is undertaken for the disease any lesser operation than total colectomy should rarely, if ever, be contemplated.

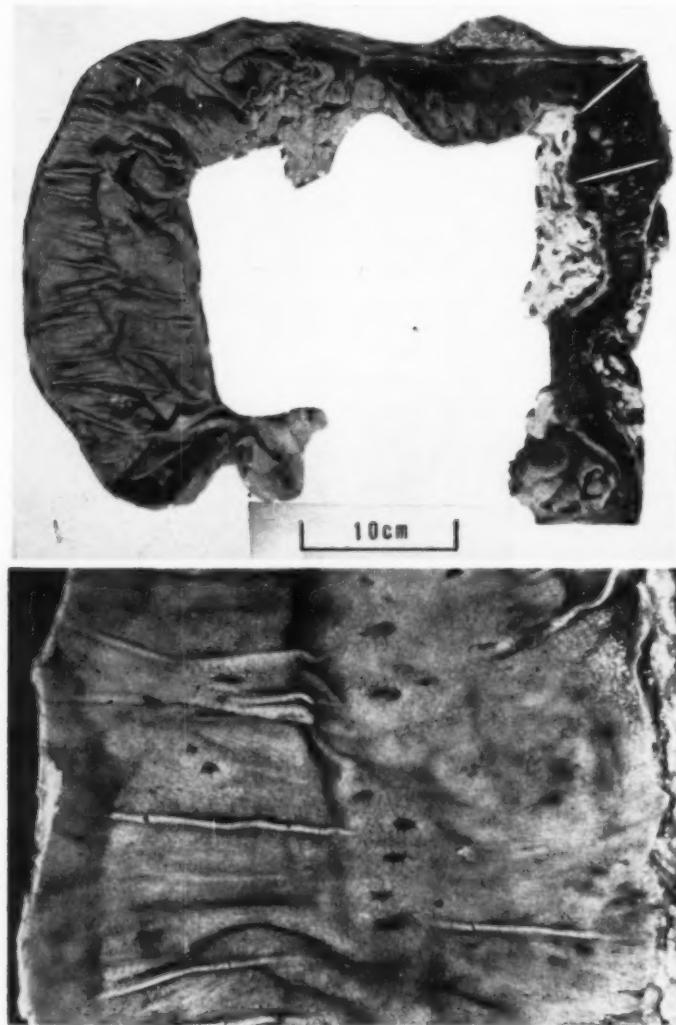


Fig. 1 (a) The colon from a case in which the X-ray and operative findings were those of a left-sided colitis.  
(b) Magnified view of a part of the right side of the same colon. The apparently normal bowel is seen to be affected with multiple superficial scattered ulcers.

#### DIFFUSE ULCERATIVE COLITIS AND ITS TREATMENT

The second point I wish to consider is the relationship, if any, between pseudopolyposis and cancer. Naturally if pseudopolyps are pre-malignant it would be an additional argument in favour of extirpating the rectum if such are present. But they are not new growths and consist merely of shreds of mucosa torn from their underlying attachments, swollen with oedema and attenuated by intestinal activity. They show no resemblance to true adenomata and on microscopic examination their lining cells do not show excessive staining or mitotic division. Most workers such as Hardy and Bulmer (1933), Felsen and Wolarsky (1949) and Swinton and Warren (1939) in America and Dukes (1954) in this country deny the pre-malignant characteristics of these pseudopolyps. From a clinical point of view I do not feel worried about these fragments of mucosa, as with recovery after total colectomy those residual in the rectum seem to fall back on to the underlying rectal wall and rapidly lose their identity.

Although pseudopolyps seem innocent of the hazards of carcinomatous change, few will doubt that ulcerative colitis, particularly in the long-standing case, predisposes to the development of cancer. The incidence of this change is differently reported by various authors. Wheelock and Warren (1953), for example, estimate that over 18 per cent. of cases who have had the disease, whether in a mild or severe form, for over 10 years or more, will develop cancer, though the proportion in a series reported by Bargen and his fellow workers (1954) from the Mayo Clinic was only a little over 6 per cent. amongst 1,500 patients. The examination by Counsell and Dukes (1952) of the colons of 63 consecutive patients who had undergone operation at St. Mark's Hospital revealed 13 cases of carcinoma—and a still higher incidence is reported by Rosenquist and his colleagues (1959), who state that amongst patients who have had ulcerative colitis for 10 to 20 years, one in three develops cancer. In my own series, two patients had resectable cancer at the time of operation and one was observed to have a lesion in the rectal stump during his follow-up. In addition to these a further seven patients were operated upon, but all had widely disseminated disease. Thus in 140 cases there were 10 patients with cancer—an incidence of approximately 7 per cent.

The real interest in ascertaining the incidence of cancer is to determine whether the risks of its development are great enough to indicate whether a colectomy should be undertaken as a prophylactic measure in the milder chronic type of case.

The mortality rate in my series of cases of total colectomy and ileo-rectal anastomosis is approximately 5.5 per cent., a figure that is less than the incidence of cancer. Moreover this mortality includes operative deaths in the very acute and fulminating cases. From these considerations I think the conclusion is inevitable that if after a period of three years or so the disease still persists, even though there may have been

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intervening periods of quiescence, operation should be advised. I may be in the minority in suggesting this course of action, but such advocacy is strengthened by my certainty that in the vast proportion of cases of ulcerative colitis, and in all of those to which I refer now, the disease, with its risk of cancer, can be cured without subjecting the patient to a permanent ileostomy. Physician and surgeon would be rightly hesitant to advise an operation prophylactic against the development of carcinoma involving this disability: but where a technique exists which allows the restoration of the normal route of evacuation, then surely it must be advocated for a condition which we know, in a not inconsiderable proportion of cases, carries the risk of the development of a most virulent form of cancer.

Lastly, it must be emphasized that the diagnosis of malignant change at a stage when the condition is curable is virtually impossible in the vast majority of cases. This is made very evident by the fact that of my 10 cases with this complication only one remains alive. The comparable survival rate of otherwise normal patients with cancer of the large intestine attending my out-patients is above 60 per cent. The symptomatology of cancerous change is indistinguishable from the disease it complicates and it rarely produces the X-ray changes characteristic of a cancer occurring in the general population. Thus it is only by earlier operation, as I have indicated, particularly in the young where the growth seems to be outstandingly anaplastic, that the complication of cancer can be avoided.

At this stage in my lecture it is fitting for me to refer to the one patient in this series who developed cancer in the residual rectum following total colectomy and ileo-rectal anastomosis. This patient's symptoms of colitis started when he was a little over two years of age, and until he was 19, when operation was undertaken, he had never been completely free from these in spite of intensive medical treatment. In 1956, I operated upon him. The rectal ulceration, however, never resolved completely and two years later this was shown to be due to a definite carcinoma. An abdomino-perineal excision was carried out, but the disease was widespread in the pelvis. Secondary deposits developed subsequently in the lungs and he died.

It is possible and I think likely that the carcinoma was present at the time of his original operation but was not identified. My experience in this case inclines me to the view that if a patient has had the disease for a period of 12-15 years or more removal of the whole colon may be the preferable operation because of the possibility of the existence of an already established but unrecognizable rectal carcinoma.

I would next like to draw attention to that group of cases in which gross dilatation of the colon is a feature not only of the pathology of the condition but of its clinical aspect as well (Fig. 2). The usual pathological

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change in this disease consists of the formation of abscesses in the crypts of Lieberkühn which, spreading into the sub-mucosa, strip the overlying mucosa and ulcerate into the underlying muscle layers. Fibrosis is the compensatory mechanism that limits and localizes this spread, but in the type of case to which I refer the condition is so virulent that perhaps in a few days this erosive process proceeds through the wall of the bowel over a considerable part of its length without any signs of limiting fibrosis whatsoever. Thus the wall of the bowel rapidly degenerates into little more than a ragged mucosal lining separated from the peritoneal cavity by the peritoneum alone. As a result of the destruction of the muscle wall and the nervous plexi as well, no peristalsis takes place so that the colon distends, mainly with contained gas, until a combination of the erosive process and the increased intraluminal pressure causes large ruptures into the peritoneal cavity.

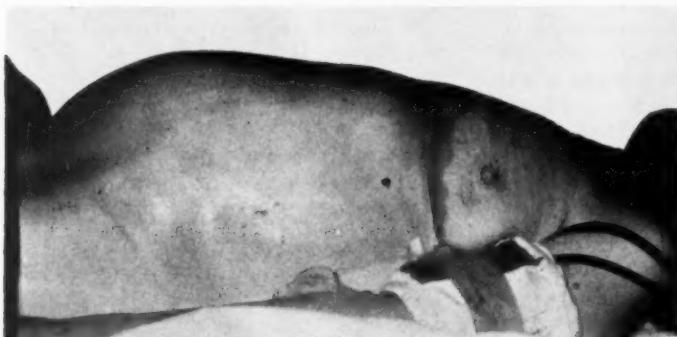


Fig. 2. Gross distension of the abdomen, the result of dilatation of the colon occurring in a fulminating case of the disease.

This complication has been seen in early acute cases as well as in those who previously have had the disease in a chronic or sub-acute state for several years. From the clinical point of view it may cause confusion if its cause is not appreciated. The cessation of peristalsis results in a decrease in the number of bowel actions and the condition is oftentimes not associated with haemorrhage. Until perforation has occurred tenderness of the abdomen may not be marked so that the clinician may be misled into considering that the case is responding to medical treatment or that a sub-acute obstruction, to be treated conservatively, is developing. On the contrary urgent operation is required before the sudden and inevitable disruption of the bowel occurs. A barium enema should never be undertaken for obvious reasons.

### **Diagnosis and indications for operation**

The diagnosis, with the exceptions mentioned, rarely presents difficulty. The history of the passage of blood and discharge associated with increased bowel actions, the toxæmia in the acute case represented by fever, increase in pulse rate and general malaise and the abdominal discomfort particularly on the left side all suggest ulcerative colitis. However, stool examination should be carried out in order to exclude abnormal pathogens and particularly in tropical or sub-tropical countries the presence of the *Entamoeba histolytica* must be sought for as the differential diagnosis of the two conditions may be particularly confusing. Sigmoidoscopy will, of course, reveal the oedematous red swollen and spongy mucosa with varying degrees of ulceration and pseudo-polypoid formation and the purulent discharge associated therewith.

The extent of the disease can only be revealed by a barium enema, but it is here, as I have mentioned, that erroneous interpretations of its spread can be made for there is no doubt that the X-ray appearances of irregularity of outline of the bowel and loss of haustration occur only when a severe degree of change has taken place. I think it important to mention these limitations of diagnosis by X-rays, as, to reiterate what I have said before, I feel that if operation is necessary nothing less than total colectomy should be undertaken, in spite of an apparently normal radiographic appearance of a part of the colon.

The difficulty lies not so much in making the diagnosis but in the selection of those cases which require surgery for their cure and in the assessment of the optimum time at which operation should be undertaken. That this assessment is so often in error is indicated by the appalling condition into which patients have often degenerated before they are finally referred for surgery. This I am sure is the experience of all clinics specializing in the treatment of ulcerative colitis.

I think rather than to enumerate a lifeless list of indications for operation a more accurate impression will be given if I generalize by saying that as soon as a patient, whilst under a full medical regime of treatment, loses ground in any stage of the disease then operation should be advised. This loss of ground I would estimate by daily impressions of the patient's condition, by any loss of weight, by increases in the temperature or pulse, or by failure of the latter, if increased, to resolve, by any persistence of abdominal tenderness or by any distension of the abdomen, by a failure to maintain the haemoglobin level in spite of transfusions and by any rise in the white cell count. I purposely omit the daily examination of the stool because the appearance may improve and blood may disappear in spite of a progression of the ulcerative process. Under no circumstances must the condition of the patient be allowed to deteriorate to a degree that increases the hazards of an already difficult operation. If a patient is

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admitted in such a condition that these additional hazards exist it is adding risks to his only chance of recovery if anything but initial pre-operative treatment—largely the sphere of the surgeon—is embarked upon. I am absolutely against the opinion that I have heard expressed that such patients should have a preliminary course of steroids in order to make them safer risks for surgery. I think that the patient's chances are reduced thereby and not increased.

I also regard the laboratory or clinical evidence of any liver damage as an indication for operation. Boden and his co-workers (1959) have

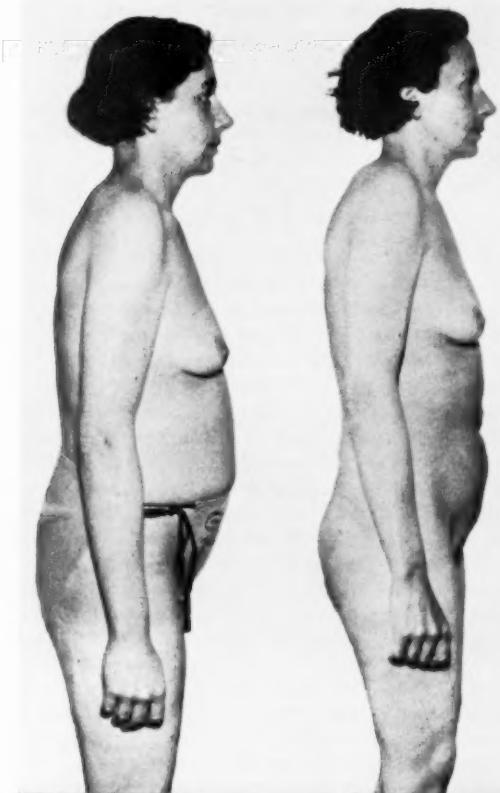


Fig. 3. Pre- and post-operative photographs of a patient who at the time of her colectomy and ileo-rectal anastomosis suffered from marked liver damage with ascites.

recently commented upon the association of ulcerative colitis with pericholangitis and fibrosis which can lead to biliary cirrhosis even when the intestinal disease may be in a mild or chronic stage. The removal of the colon can result in a reversal of the cirrhotic process. Figure 3 on the left shows a patient aged 35 who had continued with symptoms of the disease for 12 years in spite of full medical, including steroid, treatment. At the time when she was first seen in my clinic in 1955 the serum alkaline phosphatase was 46 units per cent. and all her liver function tests were correspondingly impaired. Clinically she had marked ascites. Total colectomy and ileo-rectal anastomosis was carried out, and on the right you see her appearance ten months later. There was no ascites and the serum alkaline phosphatase had been reduced to 5 units per cent. At the present day she remains in excellent health, is fully employed and is on no salt or dietary restriction.

Finally, surgery will be advised for local complications of the disease such as abscess formation or stricture, for those generalized such as arthritis, iridocyclitis or pyoderma, and in my view, as expressed previously, where the disease continues after a course of some three years.

#### Methods of surgical treatment

The standard surgical treatment of ulcerative colitis in this country as well as in America is by pan-procto-colectomy and ileostomy. There is no doubt that by this operation patients may be restored to their normal good health and the pioneer work of Brooke in this country has done much to focus attention on the life-saving benefits of surgery in this condition. But the patient is left with an artificial stoma and few would deny the aesthetic disabilities of such in spite of every improvement of ileostomy bag design. Moreover the presence of the ileostomy itself is associated with numerous complications such as obstruction, prolapse, ileitis, fistula formation and skin ulceration, so much so that at the Mayo Clinic, as reported by Bargen, only 14 per cent. of 124 patients were free of complications at the stoma within one year of operation, and 43 per cent. surviving one year required revision. What has to be decided is, is it necessary to remove the rectum in every case of colitis subjected to operation, and thus to deny the patient the chance of retaining a normal route of evacuation.

The retention of the rectum in ulcerative colitis has a bad name. The ulceration is said to persist, bleeding to continue, discharge, anal excoriation and incontinence to be the fate of the patient, and the danger of peri-rectal suppuration and cancer formation are additional weighty arguments used against anything except complete ablation of the large intestine. All I can say is that this has not been our experience in any but a very small proportion of our series.

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I wonder whether the method of total colectomy and ileo-rectal anastomosis has in the past been given a really efficient trial. I wonder whether the whole of the colon has been removed and a true ileo-rectal anastomosis carried out in most cases. I well remember seeing a film designed mainly to show the care of the ileostomy. This had been instituted in a patient who had had a so-called ileo-rectal anastomosis and because of a persistence of her symptoms had the remaining bowel excised. In this film the bowel removed at the second operation was demonstrated and it included a considerable length of the pelvic colon. It is my thesis that the whole of the pelvic colon must be excised. I believe that the disease is usually at its worst in this region and to leave such a length of severely diseased bowel is to invite the failure of the patient to recover from his or her toxic symptoms. As I will show I think it imperative that in the resection the inferior mesenteric artery should be deliberately divided at a point below the origin of the last sigmoidal branch, that is through a part of the artery which is now the superior haemorrhoidal. Thus not only is the blood supply to the rectum considerably reduced, and this I think is a factor in lessening post-operative bleeding and hastening healing, but the upper part of the rectum will not then be viable and inevitably the excision passes across its upper third.

Credit for recording the first ileo-rectal anastomosis probably belongs to Wangensteen, who in 1948 with Toon reported four cases in which the procedure had been carried out with excellent results. These authors made the comment and here I quote: "It had been suggested that the making of an anastomosis would probably lead to an upward migration of the disease. As a matter of fact the reverse occurred. The disease in the rectal mucosa cleared up." When pressed during subsequent discussion Wangensteen stated that the inflammatory changes in the rectum had been minimal in these four cases and I think the impression must have been gained that to carry out ileo-rectal anastomosis in the presence of mucosal change that included definite ulceration was to invite failure, an idea which embraces the belief that the rectal ulceration in such cases continues. This widely held viewpoint, that ulceration in such cases continues, however, has not been in accord with my experiences. Apart from the fact that the vast majority of our patients have returned to normal good health, which is unlikely had the rectal ulceration failed to resolve, we have on many occasions taken pre- and post-operative biopsies which have shown that even when severe ulceration is present the disease, as in the milder cases of Wangensteen, has resolved. The post-operative biopsies show a complete disappearance of the crypt abscesses and of the inflammatory exudate and the bowel wall becomes lined with an epithelial layer which, although it does not reproduce with exactitude the regimented palisades of mucus-secreting glands of the normal rectal mucosa, nevertheless serves as a covering which enables the rectum to exercise its normal physiological function.

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I do not find it surprising that such resolution occurs because that is exactly what happens in those cases treated successfully by a medical regime. Repeated sigmoidoscopies and biopsies in these cases similarly reveal the healing that occurs, and barium enemas show that the bowel can return to near normal. The impression that I have of this obscure disease is that if the toxæmia with which it is associated can be cured—and in the chronic as well as the acute case this is severe—then it is likely that the ulceration will resolve.

I now wish to pass to a survey of the results of this series and Table I presents the basic facts. There were 131 patients in which total colectomy and ileo-rectal anastomosis was the planned method of treatment. Twenty-three presented in a fulminating episode. I cannot improve on Bacon's (1959) definition of this type of case when he says that the term refers to

TABLE I

131 PATIENTS

Type of Case	No. of Patients	Approx. %	Deaths	Approx. Operative Mortality
Fulminating	23	17.5	3	13%
Acute	46	35	3	6.5%
Chronic	62	47	1	1.6%
TOTAL	131		7	5.4%

1 patient died of coronary thrombosis 18 months after operation.

1 patient died of cancer present at operation 12 months later.

1 patient died of cancer not observed at operation.

4 patients have been converted into a permanent ileostomy.  
(1 death included above.)

the desperately ill patient, the episode being of marked severity and intensity and associated with high fever and significantly elevated pulse rate over a period of several days. I would add, however, that the pathological examination of specimens from such cases shows extensive erosion of the whole of the thickness of the colon with little or no evidence of a limiting repair process. In Bacon's series 5 per cent. of cases were classified in this category, but in my series the corresponding figure is 17.5 per cent., of whom three of a total of 23 patients died—a mortality of 13 per cent. Three of 46 acute cases died, a mortality rate of 6.5 per cent., and one of 62 chronic cases, a rate of 1.6 per cent. For all cases, the gross mortality rate was 5.4 per cent.

Of the six other patients who died in the immediate post-operative period one probably succumbed to adrenal failure, one was *in extremis* at the time of operation, the result of general peritonitis and complicating uraæmia consequent upon a long-standing prostatic obstruction, one died following a burst abdomen after an operation for obstruction, and the remaining three of toxæmia due to intra-peritoneal abscess formation

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with multiple localized areas of peritonitis. It will be seen that three patients have died subsequently, two of whose deaths could in no way be attributed to the operation. The third, who developed a cancer of his rectum and to whom I have referred previously, might have lived had a pan-procto-colectomy been undertaken as his initial treatment. Including his death with those that occurred in the immediate post-operative phase, an overall patient mortality rate of 6.1 per cent. is recorded.

Four patients, two because of incontinence and two because of extensive peri-rectal suppuration, were subsequently given a permanent ileostomy. Of the two patients with incontinence, one had a notably patulous ano-rectal region prior to operation. She was a frail woman who even when fit weighed under 6 stones, and if a similar case presented I would be hesitant to advise a hook-up operation. In the second case there was no obvious reason why he should have been incontinent, but as the disability showed no signs of improving a permanent ileostomy was formed. Two other cases in the series suffered some incontinence for three months after operation, but with their return to good health this disability cured itself. The remaining two conversions were carried out because the rectal fistulae and peri-rectal suppuration present before operation showed no sign of healing after the colectomy and ileo-rectal anastomosis. One was in a small child, 11 years of age, who some weeks after the conversion developed a sagittal sinus thrombosis from which she died. Her death is included in the acute cases. I have no doubt now that the attempt to salvage her rectum was misguided, and that had a procto-colectomy been carried out as an initial procedure she might have lived.

The relatively low mortality in this series has been due in part to the strict observance of certain surgical principles which I think it appropriate to mention here.

Firstly, total colectomy must be undertaken in all cases, even when dealing with the fulminating or the very acute stage of the disease. I do not believe that an ileostomy alone should ever be carried out, however ill the patient. If he or she is desperately ill it is because the colon is disintegrating, and defunctioning this does not prevent haemorrhage from continuing, deep ulcers from perforating, or the grave toxæmia from overwhelming the patient. Naturally in these cases speed of operation and highly skilled anaesthesia are necessary adjuncts to success and in order to diminish the operating time to a minimum no attempt should be made to restore continuity at this stage. After excision of the colon and mobilization of the rectum by division of its posterior and the upper third of its lateral attachments it is then possible to exteriorize the open end of the latter through the lowermost part of the paramedian incision. It is held in position there by suture of the peritoneum to its wall and of the free

edges of its mucosa to the skin (Fig. 4). The open end of the ileum is also brought out through the main wound just above the proctostomy, though unlike the latter it is made to protrude two or three centimetres from the anterior abdominal wall. Ileo-rectal anastomosis is completed at a second operation when the patient's general condition allows, usually three or four weeks after the colectomy.

Primary anastomosis should also be avoided if at the completion of the colectomy there is any doubt as to the patient's condition, or if the rectum is so thinned by ulceration or friable with oedema that the stitches are



Fig. 4. The ileostomy and proctostomy formed in the two-stage operation.

unlikely to hold but to cut out with resultant disruption of the anastomotic line. If the anastomosis is delayed for a few weeks it will be found that the consistency of the rectal wall changes so that a suture line can be achieved with safety. One might rightly ask why all cases are not dealt with by this two-stage procedure. The answer is that the second stage of ileo-rectal anastomosis is often a difficult operation. The upper end of the rectum and the ileostomy have to be mobilized in order to effect their union, and coils of small intestine, which may have become closely adherent to the field of operation, make this procedure one of length and sometimes one of considerable hazard.

The second point in minimizing mortality is to establish a temporary ileostomy in continuity when a one-stage ileo-rectal anastomosis has been effected following the colectomy (Fig. 5). There is no doubt that even when the stitches in the rectum appear to be holding well and even when

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completion of the anastomosis looks certain and secure that partial breakdown can occur. It must be remembered that the rectal wall is ulcerated and infected and primary healing is not the universal rule. The temporary ileostomy diverts the intestinal content in the initial post-operative days so that even if a leak does occur it becomes sealed off and is not the mortal danger that it would be if ileal content was pouring through it into the pelvic cavity.

Before closure of this ileostomy is undertaken three or four weeks later a barium enema must always be carried out. If an unsuspected leak is identified the ileostomy is maintained and the patient sent home until such time as a repeat enema shows that the defect in the line of the anastomosis has healed and that there is no further leak (Fig. 6). Sometimes the final sealing-off process takes as long as three or four months.

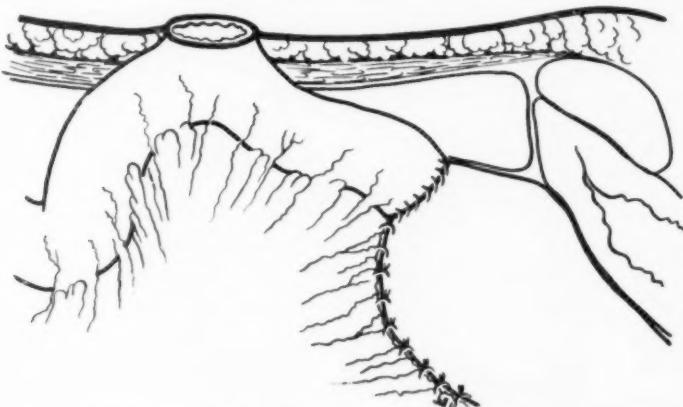


Fig. 5. Diagram to show the safety valve ileostomy formed to protect the anastomosis in a one stage colectomy and ileo-rectal anastomosis.

An experience in the past has led us to recognize the importance of making certain that the ileo-rectal anastomosis is intact before closing the ileostomy. Before X-rays were undertaken as a routine at this stage of treatment closure of an ileostomy was carried out in one case and within 48 hours she had developed a generalized pelvic peritonitis. She was desperately ill and we considered it probable that the line of anastomosis had parted. She was resuscitated and at subsequent laparotomy the pelvic cavity was cleared of the pus and intestinal content with which it was filled. It was not possible to inspect the ileo-rectal anastomosis, but in view of the fact that the patient had been perfectly fit when the safety valve ileostomy was present this was reinstalled. Subsequently the patient made a full recovery. A barium enema carried out in the convalescent

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period demonstrated the partial breakdown of the line of anastomosis, but within three months this had completely healed when the ileostomy was closed once again.

One final factor concerned with maintaining low mortality, which although a post-operative complication deserves note here, is the recognition of any post-operative obstruction at an initial stage in its development and its early treatment by surgery if conservative measures do not rapidly relieve it.

After the colon has been removed dilatation of a loop of small intestine can proceed to a most marked degree without the usual abdominal

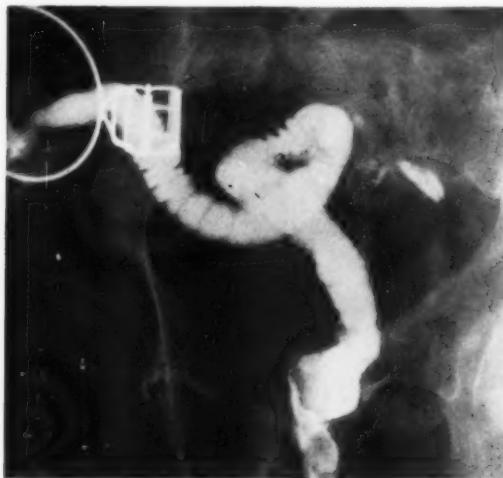


Fig. 6. X-ray showing a fully healed ileo-rectal anastomosis. A previous barium enema had demonstrated a leak through the anastomotic line and the barium that had escaped is still present in the pelvis.

distension associated with such a condition. The distended loops are lost in the intra-peritoneal spaces previously occupied by the colon. Moreover, for some time the patient's general condition remains reasonable, whilst vomiting, when the obstruction is not complete, may be slight or absent. In addition the discharges from the ileostomy often continue, though if these are measured it will be apparent that they are smaller in quantity. Such obstructions, usually the result of multiple plastic adhesions, most commonly occur in the immediate post-operative period. The surgeon is naturally hesitant to re-operate even if the condition is diagnosed, and he may treat the patient conservatively until a sudden decline in the patient's condition makes a decision inevitable. By this

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time the chance of the patient's survival is greatly lessened. I therefore consider it essential to recognize the obstruction early, and here a straight X-ray of the abdomen is of help in identifying dilated coils, and to continue conservative treatment only if a further X-ray after 12 hours shows that the distended coils are subsiding and only if repeated clinical examination of the patient shows that he is gaining and not losing ground. The slightest rise in pulse, increase in the percussion note over the obstructed area, an obvious though perhaps slight abdominal distension where none existed before, or tenderness of the area under observation are all factors that must convince the surgeon that re-operation must be undertaken. I also regard the presence of fluid levels in the X-ray as an absolute indication for early re-exploration of the abdomen.

TABLE II  
FOLLOW-UP OF 118 PATIENTS

NUMBER OF PATIENTS ..	..	48	3-7	1-3	6 months-1 year	Total
			years	years	1 year	
<i>General Health</i>						
Normal	..	..	42	47	18	107
Subnormal	..	..	6	4	1	(90%)
<i>Employment</i>						
Full	..	..	45	48	19	112
Part-time	..	..	3	3	0	6
<i>Social Activities</i>						
Full	..	..	44	47	18	109
Limited	..	..	4	4	1	9
<i>Weight</i>						
Return to normal or above	..	..	46	46	17	109
Under normal	..	..	2	5	2	9
<i>No. of Bowel Actions</i>						
Over 6	..	..	6	3	4	13
4-6	..	..	28	39	12	79
3 or under	..	..	14	9	3	26
						80%

I now wish to present in figures, pictures and words a brief account of what state of health these patients, subjected to total colectomy and ileorectal anastomosis, enjoy. Table II shows a résumé of the present situation in 118 patients, every one of whom has been closely followed up, and with the exception of three who live abroad they have been seen at frequent intervals at my follow-up clinic. The maximum follow-up is a period between three and seven years and the minimum six months. The last column is perhaps the one to which I should draw your attention. You will see that 107 patients or 90 per cent. of the total returned to normal health and this degree of normality is absolute by any standard.

These patients are engaged in many walks of life and include a doctor who completed his studies after the operation, nurses, a clergyman, long-distance lorry drivers, an engine driver, engineers, travellers, business executives, an actor and not least many housewives. They have no limitations whatsoever to their employment, to their pastimes or to their

full enjoyment of life. Two female patients have had normal confinements, and a third has been delivered by Caesarian section. Two males have sired infants, and there has been no case of impotence. Eleven patients you will see have not regained their previous robust health, and I think that three would be better off with a permanent ileostomy. These three patients are females and all had recto-vaginal fistulae, the ulceration



Fig. 7. Immediate post-operative photograph of a fulminating case and his appearance three months later.

surrounding which has failed to heal in spite of the fact that the tracks have been laid open. As a result of my experience with these cases I think that any but a very superficial fistula into the vagina may well be a contraindication to an attempt to retain the rectum. The remaining eight are managing quite satisfactorily though in some cases their social activities have limits.

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Referring to the lower part of the table in its final column it will be seen that 109 patients have returned to their normal fit weight and many have surpassed this, some to such an extent that a diet has had to be imposed. The lowermost figures of all are the number of bowel actions patients have in each 24 hours and as will be seen 105 have them open six times or less in that period. Few are ever disturbed at night and 26 have only three bowel actions or less. One remarkable female patient has her bowels open on an average twice in three days. The increase in bowel actions, usually inevitable after the removal of the colon, has not proved a problem to the patients. They have full continence and the ability to resist the desire to empty their bowel for a period that makes for no difficulty. Indeed many



Fig. 8. The colon removed from the patient shown in Figure 7.

female patients are the envy of their habitually more constipated normal sisters.

Finally in this section of my lecture may I show two photographs of a patient who has had the operation under review carried out (Figs. 7 and 8).

#### Pre-operative treatment

I wish to mention certain essential aspects of pre-operative treatment. Naturally enough in the not so acute or chronic cases when the time of operation can be elective a full build-up of the patient along accepted lines can be effected, including the administration of cortisone by oral

and intramuscular routes, if steroid therapy has been administered to the patient at any time in the preceding 18 months. This therapy must be continued well after the first post-operative week, after which it is slowly tailed off. But in the desperately ill patient all that can be achieved along these lines is a limited replacement of electrolyte fluid and blood loss. Replacement can never be expected to be complete and the surgeon is wise if he carries out the operation as soon as his judgment deems that this can be undertaken with a minimum risk, as in spite of further therapy and a nearer approach to normal blood chemistry the patient's condition may suddenly decline to a level that makes surgery a desperate measure. In such cases steroid cover when it is required is achieved by intravenous administration at the time of operation.

Wherever possible one of the non-absorbable antibiotics should be administered orally in dosage sufficient to produce the maximum effect in the minimum time. Our choice is Neomycin 1 gm. hourly for 4 hours and then 1 gm. 4-hourly for a further 16 hours if operation is delayed for that length of time. With these dosages the contents of the intestine are often rendered sterile or reduced by such proportions that if soiling of the peritoneal cavity occurs, the result of rupture of the bowel during operation, the danger of infection and resulting complications is minimized.

### **Operative detail**

We have found that the best approach is through a left paramedian incision. The incision lies closer to the splenic flexure, the mobilization of which may present difficulty, than an incision on the right and in no case has a transverse division of the rectus muscle been required to effect its liberation. Personally, standing on the left of the patient I prefer to mobilize the right side of the colon firstly and to separate the transverse colon by division of the omentum and mesocolon as far to the left as is convenient from this approach. Changing sides I then mobilize the descending colon and approach the splenic flexure mainly from below upwards, but completing its final liberation by division of the remaining part of the transverse mesocolon and omentum.

The patient is then tilted into the Trendelenberg position and the small intestines are isolated in the upper part of the abdomen by packs. A clear field for subsequent mobilization of the remaining colon and for the anastomosis is thereby obtained. After division of the peritoneum the pelvic colon is lifted into the wound and the sigmoidal arteries are divided. The peritoneal reflection on either side of the upper third of the rectum is then incised and likewise the upper part of the lateral ligaments. By separation of its posterior facial attachment to the sacrum the upper part of the rectum is mobilized. It will now be attached by a pedicle containing the superior

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haemorrhoidal vessels and associated sympathetic and para-sympathetic nerves. This pedicle is deliberately divided so that the arterial blood supply to the rectum through this source is interrupted (Fig. 9).

The mesentery of the terminal ileum is now divided and the ileum cut across. Returning to the rectum it will be found that its upper part now shows signs of loss of viability, the result of division of the superior haemorrhoidal artery. A clamp is placed across the bowel at this site and its anterior wall is then incised below this level, the incision actually



Fig. 9. Photograph showing the mobilization of the rectum from its sacral attachment and the initial stage in the division of the pedicle containing the superior haemorrhoidal artery.

passing through the upper third of the rectum. Retained intestinal content in the rectum is sucked out and its division is then completed. Finally the posterior rectal tissues are divided between clamps and the colon is free. The ileo-rectal anastomosis is completed in two layers, an outer one of interrupted thread sutures and an inner continuous suture of catgut (Fig. 10). Because of the depth in the pelvis at which this anastomosis is completed we find it simpler to insert every stitch of the posterior layer into both rectal and small intestinal walls before their two ends are approximated and the sutures tied. This is a small technical point, but there is no doubt that it facilitates this rather difficult suturing.

The free margin of the mesentery is now sutured to the free edge of the peritoneum of the posterior abdominal wall in order to eliminate at least one source of post-operative intestinal obstruction. The first step in the formation of the safety valve ileostomy is the concern of the next stage of the operation.

A circle of skin 2 cm. across is removed from the right iliac fossa and the muscle wall is divided. The summit of a loop of small intestine suitably chosen so that the line of anastomosis is under no tension whatsoever and sited about 10 cm. above this is drawn through the incision and retained in position temporarily with a pair of Babcock's forceps. The intra-peritoneal gap between the lateral abdominal wall and the mesentery of the emerging loop is obliterated by sutures again to avoid another

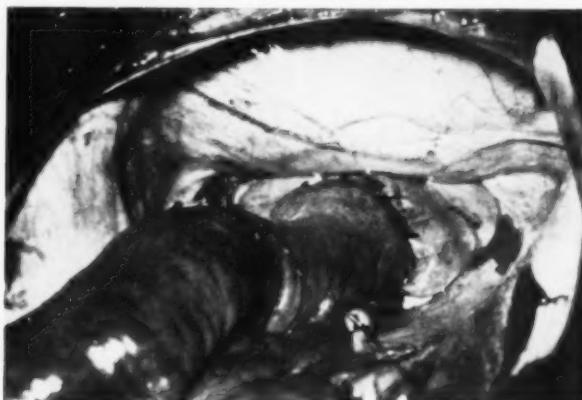


Fig. 10. Photograph of the ileo-rectal anastomosis at its completion. The line of union lies deep in the depths of the pelvis.

source of post-operative intestinal obstruction, after which the main wound is closed usually with drainage into the pelvis.

Attention is again turned to the emerging knuckle of small intestine and the peritoneum is sutured to its wall with interrupted stitches. Finally, the small intestine is opened and skin margins are sewn to its free edge to complete the safety valve ileostomy, and the operation.

In those cases in which the procedure is carried out in two stages, the colectomy is completed in the manner described. Slightly fuller mobilization of the rectum is required, however, to enable its open upper end to reach to the surface of the abdomen at the lowermost part of the paramedian incision, where the wall is sutured to the peritoneum and its open end to the skin after excision of a small circle thereof. The ileum is

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similarly brought out of the same incision 3 cm. or so above the proctostomy and its wall is sutured to the peritoneum. Its end may be turned back on itself in the manner in which a permanent ileostomy is established, but as it is of a temporary nature only this embellishment is not really necessary.

The safety valve ileostomy does not close of its own accord and a minor operation is necessary to eliminate the intestinal fistula. This is usually carried out about three weeks after the colectomy, but before this, as has been mentioned, a barium enema X-ray must have shown that the anastomotic line is absolutely secure and that there is no leakage of barium therefrom.

In the two-stage operation a more elaborate dissection is required to separate the ileostomy and the proctostomy and to effect the union of the two ends. The region involved is usually walled off by intra-peritoneal adhesions so that the anastomosis remains isolated from the general peritoneal cavity. Breakdown of the anastomosis in any degree has been infrequent, but should it occur the fact that the line of union is isolated does not involve the danger of spillage of intestinal content into the peritoneum. Usually small resultant fistulae heal up, but on the occasions when they have persisted a further suture may be required and in two cases a completely defunctioning ileostomy has had to be instituted to short-circuit the intestinal content away from the anastomotic line before it finally healed. Subsequently the two ends of the ileum were re-united in both patients with a final entirely satisfactory result.

#### Post-operative care and complications

In the straightforward case the ileostomy discharges on the second or third day and the fluid and electrolyte loss that then results must be strictly replaced. We have recently recognized that in addition to the common sodium, chloride, and potassium deficiencies, a fall in the blood calcium sometimes occurs to such an extent that an established tetany can develop. This may require, amongst other methods of treatment, the intravenous administration of calcium gluconate for its control.

The importance of the administration of steroid therapy as a cover for the operation and for the immediate post-operative period in those patients who have been given the drug pre-operatively is well known. I believe, however, that some of the gravely ill patients not so treated suffer from steroid deficiency and it has not been uncommon for sudden and alarming falls of blood pressure to occur without any obvious cause. These falls have responded dramatically to the administration of intravenous cortisone without which I am sure that three patients would have died. As mentioned previously, we believe we lost one patient from an under-dosage of this drug.

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After the ileostomy has been working freely for 48 hours and the patient has commenced to take food, drugs are given to stiffen up the evacuation and to slow down peristalsis. As a routine we use Isogel 1 drm. three to four times a day, Codeine Phosphate gr.  $\frac{1}{2}$  t.d.s., and gr. 1 nocte, and oftentimes one of the anticholinergic group of drugs. Slowing of the number of actions is usually quite rapid. Two or three days before the safety valve ileostomy is closed these drugs are discontinued and the patient is given a course of Neomycin. Once again when the patient starts to have bowel actions through the rectum two or three days are allowed to elapse before the same drug routine to minimize their number is reinstated.

The number of bowel actions usually steadily diminishes in the succeeding post-operative month and many patients discontinue all or most of their medications altogether. In some rather stubborn cases we have found Penicillin V. and Sulphonamide tablets, a combination marketed by Lilleys, invaluable in producing a dramatic lessening of bowel activity.

TABLE III

PRINCIPAL COMPLICATIONS OCCURRING IN 50 PATIENTS

Obstruction: 19 episodes requiring operation in 13 patients

Wound dehiscence and intestinal fistulae	...	...	4
Post-operative rectal bleeding	...	...	7
Post-operative intraperitoneal bleeding	...	...	1
Intraperitoneal abscess (including sub-phrenic)	...	...	6
Peritonitis	...	...	1
Staphylococcal enteritis	...	...	1
Confusional insanity	...	...	3
Femoral thrombosis (1 pulmonary embolus)	...	...	3
Adrenal failure	...	...	3
Superficial anal fistulae	...	...	7
Foot drop (bilateral)	...	...	2
Ventral hernia	...	...	3

Why it should work I do not know, but, as a result of our researches, it does not appear to alter the character of the intestinal flora either in numbers or in type. I would like to say that the value of this drug was brought to my attention by a Sister at the Gordon Hospital who noticed the diminished number of bowel actions in a patient with an ileo-rectal anastomosis who had been ordered these tablets for a severe bronchitis.

Unhappily this uninterrupted post-operative return to health is by no means the rule and the complications that can and do occur will tax the skill, the ingenuity, the time and tenacity of any surgeon looking after these cases more than following any other type of operation I know. A lecture could be devoted to these complications, but my time is short and I must mention them briefly. Table III shows the major complications occurring in 50 of the 120 under review, the remainder having had none or only minor interruptions to their recovery. Obstruction has produced the

#### DIFFUSE ULCERATIVE COLITIS AND ITS TREATMENT

greatest anxieties, and in one patient five episodes had to be dealt with by operations and in two others each had two obstructions. The causes of these episodes have been due to adhesions to small intraperitoneal collections of pus, to plastic peritonitis, and occasionally to a volvulus of the small intestine, circumstances associated with the condition rather than the type of operation.

I have mentioned the importance of dealing with these obstructive episodes at a stage in the complication before the patient's condition has declined to an extent that makes a further operation hazardous. It cannot be over-emphasized. We have tried both absorbable and non-absorbable ligature material in an endeavour to see whether one or other of these was responsible for the small collections of pus developing about sites of ligation which are so frequently associated with the adhesions that produce the obstruction. I think that where absorbable catgut sutures have been used obstruction has been less frequent and we now use these throughout with the exception of the one line of thread sutures employed at the line of anastomosis.

When one obstruction has been dealt with the chance of a further from a similar cause is not ruled out. In an endeavour to prevent this we now thread a plastic tube through the ileostomy at the time of the first operation for obstruction and guide it as far towards the jejunum as is feasible. We then know that even though adhesions form they will glue the intestinal coils together in such a way that the passage of intestinal content is unlikely to be interrupted. The tube is removed from the ileostomy after four or five days. The method is really a modification of Nobel's plication designed for a similar purpose, but it is simple and takes far less time than the more complicated method.

Partial dehiscence of an infected and emaciated abdominal wall with the formation of multiple intestinal fistulae and the final closure thereof has also presented problems, and rectal bleeding, severe and needing pints of transfused blood for its final arrest, has caused us great anxiety in the immediate post-operative period.

This résumé of post-operative complications may give some idea of their complexity, especially when several are present together in the same patient. Nevertheless with few exceptions they have been finally overcome.

In conclusion may I say these few words. Any success that has been achieved is not my own. It is shared by the nurses and in particular the Sisters at the Gordon Hospital, to whose skill, care and encouragement so many patients owe their return to normal life. It belongs, too, to my registrars and to my housemen—I could never have had finer team mates—and to the hours of work day and night they have devoted. It belongs, too,

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to my friend and anaesthetist Dr. C. B. Lewis. With him all problems of pre- and post-operative care have been discussed and his wise counsel has often guided my hand. Moreover, no one could have controlled the juke box at the head of the operating table with greater skill.

Finally, may I offer my sincere thanks to my friend Dr. Peter Hansell. He has been responsible for all the illustrations used in this lecture and I am indeed indebted to him.

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NEW COLLEGE PUBLICATIONS

READERS ARE REMINDED that two new publications are now available and may be ordered from the Librarian of the College or from any bookseller.

*The History of the Royal College of Surgeons of England.*

The official history of the College, written by Sir Zachary Cope, F.R.C.S., and published by Anthony Blond, Ltd. Price 63s. a copy, postage 2s. The author has traced the development of the College from a City Livery Company to the progressive surgical institution that it is at the present time. There are biographies of distinguished surgeons and the volume is illustrated with more than 36 pages of plates. The Librarian has contributed a chapter on the Library and Miss Jessie Dobson has written the history of the Hunterian Museum.

*A New Catalogue of Portraits*, price 30s. a copy, postage 1s. 3d. This new catalogue has been compiled by the Librarian of the College, Mr. W. R. Le Fanu, M.A., and contains descriptions of all the portraits and paintings in the College with details of their history. There are four coloured plates and over 100 black-and-white illustrations. Published by Messrs. E. & S. Livingstone.

## THE THIRD INTERNATIONAL CONFERENCE ON MEDICAL ELECTRONICS

by

**D. W. Hill, M.Sc., A.Inst.P., A.M.I.E.E.**

Research Department of Anaesthetics, Royal College of Surgeons of England

THE THIRD INTERNATIONAL CONFERENCE ON MEDICAL ELECTRONICS was held at Olympia in London from the 21st to the 27th July 1960. It was organized by the Electronics and Communications Section of the Institution of Electrical Engineers in association with the International Federation of Medical Electronics.

The Conference was divided into the following sections: "Instrumentation for Medicine and Biology", "The Motor and Nervous Systems", "Medical Electronics in Aviation and Space Flight", "Efficiency, Reliability and Safety of Hospital and Medical Electronics Equipment", "Instrumentation for Physiology and Neuro-physiology", "The Circulatory System", "Electronic Aspects of Sight, Hearing and Locomotion", "The Respiratory System", "Ultrasonics and Microwave Radiation", "The Digestive System—Telemetering", "Isotopes", "Radiology", and "Obstetrics".



Fig. 1.

D. W. HILL

It can be seen that the range of subjects covered was wide. Most of the sections were divided into a general and a specialist section. The papers in the general sections were chosen to give a broad survey of the particular field and to act as an introduction to interested doctors or engineers. With more than 130 papers listed in the programme it is not possible to give details of individual contributions; the proceedings of the conference will, however, be published at a later date in book form.

In addition to the presentation of papers there was a scientific and trade exhibition. In the trade exhibition there was a good representation of British firms in addition to companies from Denmark, France, Germany, Holland, Italy, Japan, Sweden, Switzerland and the U.S.A.



Fig. 2.

Electronic instruments for use with the cardio-vascular system were prominent. These included defibrillators, pacemakers and foetal heart monitors. Several complete monitoring systems for use during cardiac surgery were also on display. There was demonstrated a neat device for measuring the volume of blood contained in surgical swabs and dressings. During the course of an operation the used swabs are dropped into a bath of solution contained in an adapted washing machine. The agitation of the machine removes the blood from the swabs and causes it to pass into the solution. The electrical conductivity of the solution is continuously measured by means of an alternating current bridge technique. A large dial is graduated in terms of ml. of blood loss. Several types of electro-cardiograph were shown,

#### THE THIRD INTERNATIONAL CONFERENCE ON MEDICAL ELECTRONICS

including portable transistorized versions. There were also phono, ballisto and vector cardiographs, and electro-manometers for pressure measurement.

The section comprising exhibits from university and hospital departments was thronged with visitors. Several hospitals, the Medical Research Council and the Royal College of Surgeons were all represented. The genuine interest shown in the apparatus on display by all those visiting the stands amply repaid the hard work that had gone into the construction of the exhibits.

A photograph of the College stand shows the range of general purpose monitoring equipment on display (Fig. 1). A low frequency function generator produced a simulated electro-cardiogram which was continuously displayed on a long persistence cathode ray tube connected to a cardiophone and heart rate meter. Another demonstration was provided by a servo-controlled pump which could generate various typical respiratory patterns.

A good deal of this equipment, which is in use in the Research Department of Anaesthetics, was produced in the mechanical engineering workshop by Mr. Hook and Mr. Benn and in the electronic workshop by Mr. Mable. Figure 2 shows a section of the mechanical engineering workshop. At present work is aimed at completing the exhibits that the Department will be showing at the next Physical Society's Exhibition in January 1961.

Professor R. F. Woolmer was a member of the Conference Organizing Committee and Mr. D. W. Hill read a paper on "Modern Methods of Respiratory Gas Analysis".

Throughout the conference, speaker after speaker stressed the need for doctors and engineers to work together to plan an equipment or experiment from the first stages and bring it to fruition. In the College we are fortunate that this kind of co-operation flourishes.

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#### ANATOMICAL MUSEUM

THE SPECIAL DISPLAY for the month of October consists of specimens of special historical interest, including specimens brought back by Captain Cook from his voyage round the world in 1773.

### THE HONORARY MEDAL OF THE COLLEGE

THE HONORARY MEDAL was mentioned in the *Annals* of September 1955 by Professor K. F. Russell of Melbourne, when he described the Anatomist's Medal of the Company of Surgeons.



The Honorary Medal of the College

The present Bye-Law regulating the award is the same in essence as the older one quoted by Professor Russell, and now reads:

"There shall be an Honorary Medal of the College, to be awarded by the Council under such rules and conditions as the Council shall from time to time determine.

"The Honorary Medal shall not be awarded to any Member of the Council."

The appropriate Standing Rule of the Council lays down that:

"The leading considerations in awarding the Honorary Medal of the College shall be liberal acts or distinguished labours, researches and discoveries, eminently conducive to the improvement of natural knowledge and of the healing art."

The Honorary Medal was instituted in 1802 and has been awarded thirty times, as is apparent from the following list:

1822	James Parkinson	1931	George Buckston Browne
1825	Joseph Swan	1936	James Alexander Murray
1834	George Bennett	1937	Sir James Frank Colyer
1869	William Lodewyk Crowther	1942	Viscount Nuffield
1876	Thomas Bevill Peacock	1944	Sir William Henry Collins
1883	Richard Owen	1946	Sir Alexander Fleming
1884	Sir Wm. James Erasmus Wilson	1947	William Edward Gallie
1897	Sir James Paget, Bt.	1949	Frederic Wood Jones
1897	Lord Lister	1949	Sir Arthur Sims
1906	Sir Richard Havelock Charles	1949	William Ewart Gye
1910	Robert Fletcher	1950	Lord Webb-Johnson
1925	Richard Higgins Burne	1956	Lady Webb-Johnson
1929	Sir George Henry Makins	1956	William Robert Gibson
1930	Grafton Elliot Smith	1956	Edward Lumley Lumley
1930	Robert Lawford Knaggs	1960	Sir Cecil Pembrey Grey Wakeley, Bt.

#### THE HONORARY MEDAL OF THE COLLEGE

The medal itself bears on the obverse the Arms of the College and on the reverse "Galen contemplating a human skeleton". The design was by Thomas Pingo (1692-1776). Professor Russell, in pointing out that the College apparently used the dies of the disused Anatomist's Medal when the Honorary Medal was started, described this design as wholly appropriate to an anatomist's medal but somewhat out of place on the Honorary Medal of today. A new die for the obverse must have been made in 1822 (the date of the first award) for in that year the College received a Grant of Arms and discarded the design used unofficially by the former Company.

It is well known that gold medals sometimes have an unusual history as the date of their award recedes into the past, and there is on record an enquiry about the nature of the medal from a gentleman in Brisbane who had saved one of them from the melting pot because of its beauty. It turned out to have been an Honorary College Medal awarded to an inhabitant of Devonshire nearly 100 years earlier.

More satisfying is the fate of the Honorary Medal awarded to Sir Erasmus Wilson, which is preserved in the College in a pleasant manner. Erasmus Wilson had his medal inserted in the lid of a handsome silver flagon presented to him by a grateful patient (Lt.-Gen. Sir George Arthur, Bt.), and later bequeathed the flagon, with two accompanying goblets, to Edward Trimmer (Secretary of the College 1865-1901). The College subsequently purchased the cups from Mrs. Trimmer.

When the Honorary Medal is to be awarded there must always be a written nomination signed by six members of the Council, and in two cases at least the enthusiasm for the award has been so great that all of the members have insisted on signing. After its award the medal is ceremonially presented to the recipient by the President during a meeting of the Council.

K.C.

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#### WEBB-JOHNSON LECTURE

THE NEXT WEBB-JOHNSON Lecture will be given at 5 p.m. on Friday, 17th February 1961, by Dr. H. B. G. Robinson, Dean of the School of Dentistry of the University of Kansas City and President of the International Association for Dental Research. Dr. Robinson has chosen as his title "The Effect of Operative Procedures on the Pulp". The lecture will be open to all Fellows and Licentiates of the College and medical and dental practitioners as well as medical and dental students.

## DONATIONS

DURING THE LAST few weeks the following generous donations have been received:

### *McIndoe Memorial Fund:*

£1,000	Lady Agnes Bell
£500	Gladys, Lady Kindersley
£52 10s. 0d.	Percy R. Levy, Esq.
£50	National Bank of New Zealand
£22 1s. 0d.	Marks & Spencer Sports Club (Birmingham)
£10 10s. 0d.	H. L. Knee, Esq.
	Hogg, Robinson & Capel Cure, Ltd.
£10	R. G. Pulvertaft, Esq., F.R.C.S.
	Mrs. Stephen Hancock
	Air Chief Marshal Sir Douglas Evill, G.B.E., K.C.B., D.S.C., A.F.C.
£5 5s. 0d.	Dr. C. J. Hackett
	Miss I. M. S. Cade, F.R.C.S.
£5	Miss J. Hobson
£3 3s. 0d.	Dr. J. F. Rickards
£2 2s. 0d.	Mrs. S. L. Righyni
£1 1s. 0d.	W. H. Bleaden, Esq., F.R.C.S.
	Brigadier J. M. Weddell, C.B.E., F.R.C.S.
£1	J. Gaymer-Jones, Esq., M.C., F.R.C.S.
5s.	A. Chance, Esq., F.R.C.S.
	Anonymous donation
£100	T. D. Rees, Esq., M.D., F.R.C.S.
£50	R. H. Ivy, Esq.

### *Appeal Fund—Covenants:*

£210 p.a. for 7 years + tax	Ore Sales & Services, Ltd.
£15 p.a. for 7 years + tax	Exchange Telegraph Co., Ltd.
£10 p.a. for 7 years + tax	Young & Co.'s Brewery, Ltd.

### *Appeal Fund—Contributions:*

£5,000	Agnes Spencer Charitable Trust (further gift)
£1,050	R. J. McNeill Love, Esq., F.R.C.S.
£500	Norwich Union Life Insurance Society (further gift)
£250	Brooke Bond Co., Ltd. (further gift)
£210	Woodfords (Leicester), Ltd. (further gift)
£105	Dame Violet Wills, D.B.E.
	Richard Johnson & Nephew (further gift)
	Colgate-Palmolive, Ltd. (further gift)
	Arthur Lee & Sons, Ltd. (further gift)
£100	W. E. Dunn, Ltd. (further gift)
	Watney, Combe Reid & Co. (further gift)
	H. & R. Johnson, Ltd. (further gift)
	Guiness Mahon & Co. (further gift)
£52 10s. 0d.	National & Grindlays Bank, Ltd. (further gift)
£50	The Thermal Syndicate, Ltd. (further gift)
	District Bank, Ltd. (further gift)
	Hoover, Ltd. (further gift)
£26 5s. 0d.	Bass, Ratcliff & Gretton, Ltd. (further gift)
	R. G. Shaw & Co. (further gift)
	Ralli Bros., Ltd. (further gift)
	Blackburn Assurance Co. (further gift)
	Steward & Pateson, Ltd. (further gift)
	Drake & Gorham, Ltd. (further gift)
	Hall & Co., Ltd. (further gift)

#### DONATIONS

£25	Westland Aircraft, Ltd. (further gift)
£21	R. Raphael & Sons, Ltd. (further gift)
£20	B. S. & W. Whiteley, Ltd. (further gift)
£10 10s. 0d.	Caledon Shipbuilding & Engineering Co., Ltd. (further gift)
	Demolition & Construction Co. (further gift)
	William Brown & Co. (Ipswich) (further gift)
	Blackpool Tower Co., Ltd. (further gift)
	Foster Sproxton, Esq. (further gift)
	Gilbert-Ash, Ltd. (further gift)
£10	Winterbotham, Strachan & Playne, Ltd.
	Charles Richards & Sons, Ltd. (further gift)
£5 5s. 0d.	H. M. Workman, Esq.
	Asprey & Co., Ltd. (further gift)
	Wimbledon Stadium, Ltd. (further gift)
	Cox & Danks, Ltd. (further gift)
	Readson, Ltd.
	Aldford House (Park Lane), Ltd. (further gift)
	Orion Insurance Co., Ltd. (further gift)
	S. Figgis & Co., Ltd. (further gift)
	Tesco Stores, Ltd. (further gift)
	The Car Mart, Ltd. (further gift)
	Hugh Mackay & Co., Ltd. (further gift)
£5	Mrs. Steinthal
	Addressograph-Multigraph, Ltd. (further gift)
£2 2s. 0d.	W. H. Mosley Isle, Esq.
	Pool, Lorrimer & Tabberer, Ltd. (further gift)
	Convoys, Ltd. (further gift)
	R. H. O. Hills, Ltd. (further gift)

#### *Voluntary annual subscriptions by Fellows:*

The following Fellows of the College and Fellows in Dental Surgery have generously undertaken to make a voluntary annual subscription under covenant to the College:

D. P. Choyce, F.R.C.S.  
W. S. Lewin, F.R.C.S.

C. E. P. Markby, F.R.C.S.  
G. E. Ray, F.D.S.R.C.S.

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#### APPOINTMENT OF FELLOWS AND MEMBERS TO CONSULTANT POSTS

D. E. BOLT, F.R.C.S.	Surgeon, West Middlesex, South Middlesex and St. Bernard's Hospital.
W. B. N. BOMFORD, F.R.C.S.	Surgeon-in-Charge, British Petroleum Refinery Hospital, Aden.
A. E. CARTER, F.R.C.S.	Surgeon, King Edward Memorial Hospital and Clayponds Wing.
A. E. RICHARDSON, F.R.C.S.	Neurosurgeon, Whittington Hospital.
C. A. SIMMONS, F.R.C.S.	Obstetrician and Gynaecologist, City of London Memorial Hospital.
D. R. SWEETNAM, F.R.C.S.	Orthopaedic Surgeon, King Edward Memorial Hospital and Clayponds Wing.
J. S. J. MORLEY, F.R.C.S.	Honorary Assistant Orthopaedic Surgeon, The Alfred Hospital, Melbourne.
R. K. RODDIE, F.R.C.S.	Consultant E.N.T. Surgeon to Bristol Clinical Area.

The Editor is always glad to receive details of new appointments obtained by Fellows and Members, either through the Hospital Boards or direct.

### In Memoriam

#### SIR GORDON GORDON-TAYLOR, K.B.E., C.B., M.A., M.S., F.R.C.S.

TO WRITE ABOUT Gordon-Taylor during his lifetime was not only an honour but a labour of love. In 1949, soon after his recovery from a serious illness, and again in 1958 on the occasion of his 80th birthday, it seemed easy to recount those events in his life which would interest his



Sir Gordon Gordon-Taylor

*(Photograph of the portrait by Mr. James Gunn, A.R.A., P.R.P., LL.D.  
Reproduced by permission of the artist.)*

IN MEMORIAM

many friends. Now that we shall not see him nor his like again the feeling of shock and the sense of irreparable loss halt the flow of words which pay tribute to one who has been the model for countless surgeons, and whose passing has brought sorrow to his colleagues and patients throughout the world.

His early classical education in Aberdeen, his entry as a student at Middlesex Hospital 62 years ago, his knowledge of anatomy and the many hours of hard work he devoted to its mastery are well known to all who have studied his career. He entered the field of surgery through the dissecting room and when he was appointed assistant surgeon at Middlesex at the age of 29 in the face of keen competition he was one of eight candidates who were all destined to achieve fame as surgeons. His interest in anatomy was maintained throughout his life and formed the basis of his success in the many major and often heroic operations which he performed. He taught surgical applied anatomy to us as students and it was through him that we learned the fascination of eponyms and remembered in after years the existence and importance of some structure which would have been forgotten under its more modern name.

The outbreak of the first war found him fully established as a surgeon and ready to take his place in the R.A.M.C. His reputation grew and it was this phase of his career which made him realize that surgery in war to be successful must often be bold. He often spoke later of those surgeons whom he admired and he would know the full details of their surgical feats. He also made many contacts with colleagues from overseas as well as at home and laid the foundations of his imperial circle of friends.

It was during the period between the wars that his surgical reputation reached its greatest heights. He was in the forefront as a pioneer in extending the scope of operative surgery. To serve him as house surgeon or registrar became the ambition of every surgical aspirant; he taught by example and his young men were given every opportunity to follow it. His surgery was never hasty and he treated the tissues with respect and gentleness. To see him, or better assist him, in a block dissection of the neck was a complete lesson in anatomical surgery. His operating sessions were often long, not because he was slow, but because he realized that time was of no importance. After a long list in hospital he would frequently come back at two or three in the morning to see a patient in whom he was particularly interested. There were many visitors to his theatre and he in turn had the habit of paying short visits to other centres where he knew the surgery would be good. At times he would take the whole firm, registrar, anaesthetist and house surgeon. Distance seemed no bar; in 1926 we went to Dundee by the night sleeper to watch his friend Jock Anderson, who had recently acquired a new American diathermy machine. We returned on the next night having spent the morning in the theatre, the afternoon at St. Andrew's University and the evening in Perth, with a

IN MEMORIAM

salmon fresh from Tay for dinner. Later in that year the trip took us to Innsbruck. It was here that we noticed that G.-T. did not seem to be in his usual good spirits and we realized on setting out for the hospital that the usual carnation was missing from his buttonhole after two days and nights in the train. The defect was remedied by a call at a florist and thereafter all was well again. On our return journey we saw Clairmont operate in Zurich and stopped in Paris to watch some surgery of a different quality which subsequently called forth some very adverse comments from our chief. This form of surgical education was made possible by his characteristic generosity and it whetted our appetites for travel when we could afford it ourselves. At home too he was an ideal host and his wife a charming and gracious hostess; an invitation to dine at the Ritz always included our wives or fiancées and was followed by the hospital ball; he was an expert dancer himself.

During the second war he served in the Royal Navy as Surgeon Rear-Admiral; this involved many long journeys not only at home but throughout the world and served to widen still more his ever growing circle of friends and admirers. He spared no effort to save a life and a consultation with him was eagerly sought; he never failed in his subsequent records to give credit to the younger surgeons who had actually carried out the treatment he had advised. His courtesy remained unchanged; he was driven many miles by the ladies of the A.A.G.B. On one occasion rather than ask one of them to drive him back to London for some instruments he waited for a train for two hours in the middle of the night on the station at Cambridge; on the next morning he saw a patient at Grimsby and operated upon another at Lowestoft. He knew all his drivers and kept in touch with many of them after the war.

Although he remained an active surgeon for many years after reaching the age of retirement in 1943, those who were privileged to know him only in the later years will remember him mainly as an orator. His interventions in debate were few but to the point, but there is scarcely an important oration which he has not delivered, always with the scholarly grace and fascination which have made him a shining example for all time. His memory was prodigious and it was his practice after writing a speech to revise it many times and then learn it by heart; many of his great orations were delivered without the aid of a note. Nor did he forget a name or a face and he kept in touch with his friends all over the world by sending them Christmas cards, all addressed and written in his own hand. Shortly before his death he had already written over eight hundred cards to Australia, New Zealand and other parts of the Commonwealth; their recipients this year will feel their good fortune tinged with sorrow. He was punctilious in acknowledging a service, however small, and a letter delivered by hand could always be confidently expected on the same day.

#### IN MEMORIAM

The year 1956 marked the jubilee of his Fellowship of the Royal College of Surgeons of England together with that of his colleague Lord Webb-Johnson, for whom he had the greatest admiration and loyalty and whose opinion on a matter of administration he regarded as beyond criticism. The occasion was celebrated at a dinner of the Council when both of them received a large birthday cake suitably decorated. His work at the College during recent years has been outstanding in the help he has given to young surgeons from the Commonwealth seeking further training here.

His portrait by Anna Zinkeisen was reproduced in the special number of the *British Journal of Surgery* dedicated to him on his 80th birthday in 1958. The original hangs in the board room at Middlesex Hospital. The artist has told me that she immediately fell under his charm and found him a patient and considerate sitter. He was fond of animals and her dog regularly came and sat at his feet. A more recent portrait, by James Gunn, is reproduced here. It is symbolic of the affection in which he is held across the world for it was commissioned by a group of young surgeons from Australia and New Zealand to hang in the Royal Australasian College of Surgeons in Melbourne. For a short period of two weeks we were privileged to see it at the College in London; those who wish to see it now must make a long journey, but they will be well rewarded and it will undoubtedly be a magnet to attract visitors from all over the world. Had he accepted the invitation to be present at its unveiling he would perhaps have escaped the dire accident which cost him his life; he felt that after a recent illness he could manage the journey and the work but not the hospitality!

He was never fond of cars; even at the busiest time of his surgical practice he did not own a car but had a permanent engagement for a hired car, always with the same chauffeur. The responsibility of being left in charge of his patients during his absence was mitigated by the regular arrival of the limousine for a round of the nursing homes of London. He preferred to walk and even after a late meeting at the College it was unusual for him to accept the offer of a lift back to Harley Street. The walk to Lords and back was another regular habit; after a frugal sandwich lunch he would watch the cricket or talk to his friends before walking home. It was on one of these occasions that he was hit by a car on crossing the road. He recovered consciousness enough to say that he thought he was old enough to have learned to avoid it, but his injuries were such as to make full recovery impossible; he would have hated a life of inactivity and invalidism.

The loss to surgery and to those who knew him and worked with him is irreparable; perhaps it is even greater for those who did not come under his immediate influence for his was the guiding hand and brain which fashioned our careers and gave us the example of devotion to our work

IN MEMORIAM

and respect for tradition which he himself followed. It is sad to think that we shall no longer see the sprightly figure of G.-T. walking briskly along the street, his hat set at a jaunty angle, the pink carnation in his double-breasted jacket and very rarely wearing an overcoat.

Our sympathy goes out to his sister and to Miss Johnson, his constant helper for so many years, who will have Scampy his wire-haired terrier to share her grief.

E. W. R.

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**SIR ERNEST ROCK CARLING, F.R.C.P., F.R.C.S., Hon. LL.D.,  
Hon. F.F.R.**

SIR ERNEST ROCK CARLING died on the 15th July at his home in London in his 84th year. A Fellow of the College for 56 years, member of the Court of Examiners from 1926 to 1936, he never sought election to the Council, but was throughout his long life a friend of the College and at his death one of the most distinguished Fellows of his generation. It falls to very few to serve his profession in a dual capacity. As a surgeon on the staff of his own teaching hospital, from 1906 to 1942, he devoted his surgical energies and his qualities as administrator to the Westminster Hospital and School. More than any other member of the staff or any other lay Governor of the Hospital, he was responsible for the rebuilding of the Hospital and School on a new site, and much of the planning and design was of his own conception.

A clear mind, a sound critical faculty, good hands, an interest in pathology, all contributed to his reputation as a surgeon, and during the 32 years he practised as a consultant surgeon he acquired a very high reputation enhanced by his co-editorship with Sir James Paterson Ross of the *British Surgical Practice*, which has made his name internationally known for the past thirteen years.

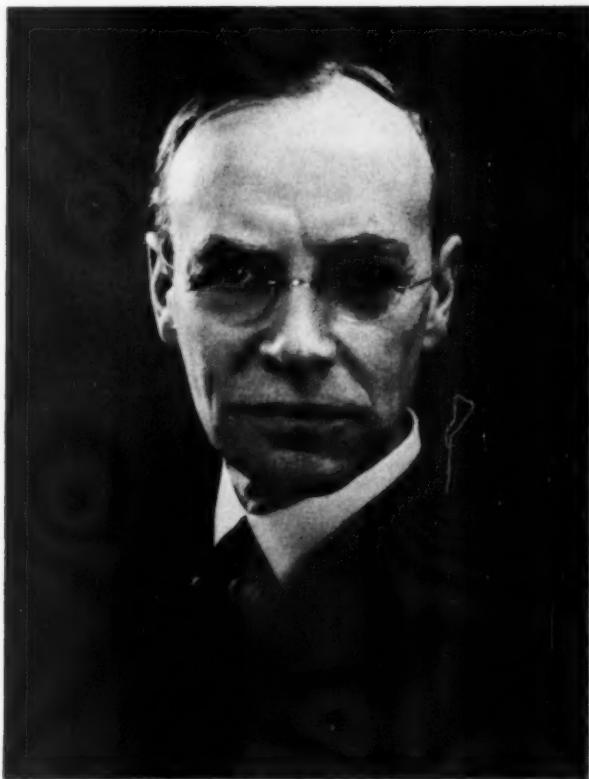
Yet Carling himself would admit that his greatest contribution to his profession was made after his retirement from the active staff of his hospital, and at an age when most surgeons no longer add to their professional achievements.

It is his pioneer contribution to therapeutic radiology which made him the great personality he became in the last phase of his long life. His grasp of the intricacies of the biological problems, of the complexities of radiation physics, of the dangers of ionizing radiations was phenomenal. In 1929, when the "r" unit was not yet defined and the facilities for accurate measurement were non-existent, he realized that physics must inevitably play a major part in the treatment of cancer patients. It was Carling's understanding which led to the appointment of "hospital physicists" as distinct from the medical school physicists.

IN MEMORIAM

His chairmanship of national and international committees on Radiation Protection is a testimony to his unique position in this rapidly developing new science. All that came before it, now in retrospect, seems to have been in preparation for what in the end was his destiny.

His long experience as a practising surgeon, his war service as a surgical dresser with the Imperial Yeomanry Field Hospital in the Boer War, his



Sir Ernest Rock Carling

service as a Major R.A.M.C. in Flanders and France in the first world war, his acceptance of radiotherapy as part and parcel of the treatment of cancer, were in fact the long preparatory period to serve his profession and his country and eventually all mankind during the second world war and the years after. His membership of the Medical Research Council, his

IN MEMORIAM

services as consultant to the Ministry of Health, Home Office, Ministry of Labour, Ministry of Supply, his work for Civil Defence and later in an advisory capacity to the Atomic Energy Authorities, inevitably led to his chairmanship of the Committee on Protection against Ionizing Radiation, and eventually to the chairmanship of the International Committee on Radiological Protection.

His intellect not only remained undimmed, but seemed to increase with advancing years. He never grew old; his belief in the inevitable application of all scientific knowledge to the practice of medicine made him a friend of the younger generation and, later on, their wise counsellor. Radiotherapy owes to him a good deal of its present important place in the practice of medicine.

With all these intricate and highly specialized duties which he accepted with joy and alacrity, he found time to serve the profession in a variety of ways besides his direct contribution to its scientific developments. As chairman of the Medical Protection Society, and his active membership of innumerable committees of the Royal Medical Benevolent Fund, the Institute of Hospital Almoners, the Society for the Relief of Widows and Orphans of Medical Men and of the Nuffield Provincial Hospital Trust, he showed remarkable humane qualities, understanding of human frailties, broad-mindedness and a great spirit of charity.

The honours and distinctions which came to him, his knighthood and various honorary degrees and fellowships, pleased him but were surpassed by his delight at having a ward in his hospital named after him, and the dinner given on his 80th birthday by a large gathering of a variety of men.

He worked till the last day and died in harness as he would have wished. Only his very few intimate friends knew of his interest in the arts and music, his love of Italy, where for many years he had a villa, his delight in travel, his personal charm and his kindness to those in difficulties.

Rock Carling was an ornament to his hospital, a great servant of the State and a Fellow of whom the College can justly be proud. S. C.

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#### THE LATE PROFESSOR SEYMOUR BARLING

THE COLLEGE WILL always be indebted to the foresight and generosity of Seymour Barling, of whom a memoir was printed in our last issue. In 1940 he offered accommodation in the barns and long drawing-room of his country-house, Alfrick Court, near Worcester, for evacuation of the College's possessions.

This made possible the removal of half the library's collections, all the priceless Hunterian paintings, and the very large collection of engraved portraits. These were housed at Alfrick in Mrs. Barling's charge for more than five years and thus escaped the bomb disaster in Lincoln's Inn Fields.

## PAGET'S SURGICAL PATHOLOGY

A LETTER FROM Anders Retzius (1796-1860), professor of anatomy in the Caroline Institute at Stockholm, to James Paget, surgeon to St. Bartholomew's Hospital, afterwards P.R.C.S. and a Baronet. Retzius was one of the leading anatomists and anthropologists of his time.

The original, in German, is in the library of the Royal College of Surgeons of England.

### Translation

Stockholm, 15 Oct. 1853

My very dear Colleague,

Yesterday I received from Messrs. Longmans Green through my bookseller the gift of your great work *Lectures on Surgical Pathology* vols. 1-2 with your handwriting on the title-page. How can I express my gratitude for this great kindness? We have had the work for several months in our library. I have read a great part of it. It is so rich in knowledge and masterly judgments that it is a work for a whole lifetime. I congratulate you, worthy friend, on having provided so much.

The work will be a classic for centuries, like those of Harvey, Willis, Sydenham and Hunter. Santesson\* treasures it too beyond all description, he consults it and quotes it often in his lectures. We have translated the first chapter only on Nutrition and Inflammation in *Hygiea*†. I believe, dear friend, that you have given up the Deanship at Bartholomew's H. and the Museum, and that you have a larger practice. I congratulate you on treading this distinguished path so outstandingly, and wish from my inmost heart that you may long be able to devote your spirit and powers to science and humanity.

Santesson has published a valuable work‡ on the med. schools of Italy, France, Holland and *England*. It is the best on this subject that I have yet read. He gives good space to St. Bartholomew's school as the model school and says much of you. He will send you a copy in a short time. At the next opportunity I shall send you an opuscule of mine on the History of Anatomy§ in the Scandinavian North.

Fare well and be assured of the great regard and true friendship  
of your truly devoted

ANDR. RETZIUS.

J. Paget, Esq.,  
London.

\* Santesson, Carl Gustaf (1819-1886), professor of surgery in the Caroline Institute, and surgeon to the Serafimer Hospital, Stockholm.

† *Hygiea*, a medical and pharmaceutical monthly, published by the Swedish Medical Society, vols. 1-100, 1839-1938.

‡ *Anteckningar om de förrämsta medicinska skolorna i Italien, Frankrike, Holland och England*, Stockholm, 1853.

§ *Anatomiens uppkomst och utveckling i den skandinaviska Norden*, presidential address to the Royal Academy of Science, Stockholm, 1854.

## FORTHCOMING LECTURES AND DEMONSTRATIONS FOR 1960-61

Monday, 17th October, at 5 p.m.  
" Modern aspects of thyroid pathology."

Thursday, 20th October, at 5 p.m.  
" Recurrent peptic ulcer after gastrectomy."

Wednesday, 26th October, at 5 p.m.  
" The injection of the blood vessels of the heart with synthetic resin."

Thursday, 27th October, at 5 p.m.  
" Genetics in relation to surgery: a historical review."

Tuesday, 1st November, at 5 p.m.  
" Polar physiology: its development in Britain."

Wednesday, 2nd November, at 5 p.m.  
" Coronary thrombosis and other forms of ischaemic heart disease."

Thursday, 10th November, at 5 p.m.  
" The accident surgery of motorways."

Thursday, 24th November, at 5 p.m.  
" The distribution of inspired gas during thoracic surgery."

Tuesday, 29th November, at 5 p.m.  
" Malignant melanoma of the choroid treated with radio-active applicators."

Thursday, 1st December, at 5 p.m.

Thursday, 1st December, at 5.30 p.m.

Wednesday, 7th December, at 2.30 p.m.

Thursday, 8th December, at 5 p.m.  
" Manchester Ship Canal and the Colonial Frontier."

Wednesday, 14th December, at 5 p.m.  
" The complications of diversion of the urinary stream."

Thursday, 15th December, at 5 p.m.

Thursday, 12th January, at 5 p.m.  
" The aetiology and treatment of achalasia of the cardia."

Tuesday, 17th January, at 5 p.m.

Wednesday, 25th January, at 5 p.m.

Thursday, 26th January, at 5 p.m.  
" Changes in blood coagulation due to perfusion for open heart surgery."

Thursday, 2nd February, at 5.30 p.m.

Erasmus Wilson Demonstration by Dr. A. R. Currie.

Moynihan Lecture by Professor J. F. Nuboer.

Arnott Demonstration by Dr. D. H. Tompsett.

Thomas Vicary Lecture by Dr. Cuthbert Dukes, O.B.E.

Arris and Gale Lecture by Mr. N. H. Porter.

Erasmus Wilson Demonstration by Dr. J. B. Enticknap.

Watson-Jones Lecture by Dr. Preston A. Wade.

Hunterian Lecture by Professor J. F. Nunn.

Hunterian Lecture by Professor H. B. Stallard.

Erasmus Wilson Demonstration by Dr. M. S. Israel.

Otolaryngology Lecture by Mr. J. Pennybacker.

Bradshaw Lecture by Sir Stanford Cade, K.B.E., C.B.

Robert Jones Lecture by H. J. Seddon, C.M.G.

Hunterian Lecture by Professor Owen Daniel.

Arris and Gale Lecture by Mr. L. Turner.

Hunterian Lecture by Professor F. G. Ellis.

Erasmus Wilson Demonstration by Dr. D. C. Caldwell.

Arnott Demonstration by Professor G. W. Causey.

Arris and Gale Lecture by Mr. N. G. Rothnie.

Otolaryngology Lecture by Professor Victor Lambert.

#### FORTHCOMING LECTURES AND DEMONSTRATIONS

Tuesday, 7th February, at 5 p.m.

Thursday, 9th February, at 5 p.m.  
" Autonomic surgery of the ear, nose and throat."

Tuesday, 14th February, at 4 p.m.

Friday, 17th February, at 5 p.m.  
" The effect of operative procedures on the pulp."

Monday, 20th February, at 5 p.m.

Tuesday, 21st February, at 5 p.m.

Thursday, 23rd February, at 5 p.m.  
" Profound hypothermia in cardiac surgery."

Tuesday, 28th February, at 4.15 p.m.

Thursday, 2nd March, at 5.30 p.m.

Tuesday, 7th March, at 5 p.m.

Thursday, 9th March, at 5 p.m.  
" Cerebral ischaemia in spontaneous subarachnoid haemorrhage."

Wednesday, 15th March, at 4 p.m.

Tuesday, 21st March, at 5 p.m.

Thursday, 23rd March, at 5 p.m.  
" Epilepsy after blunt head injury."

Monday, 27th March, at 5 p.m.

Thursday, 6th April, at 5 p.m.  
" Villous tumours of the large intestine— their pathogenesis, symptomatology, diagnosis and management."

Tuesday, 11th April, at 5 p.m.  
" The fate of autogenous tissue grafts in the heart."

Thursday, 13th April, at 5 p.m.  
" The effect of gastrectomy on pancreatic function in man."

Tuesday, 18th April, at 4.15 p.m.

Thursday, 20th April, at 5 p.m.  
" The development and uses of all-acrylic anterior chamber implants in ophthalmic surgery."

Tuesday, 25th April, 6 p.m.

Tuesday, 2nd May, at 5 p.m.

Thursday, 4th May, at 5.30 p.m.

Erasmus Wilson Demonstration  
by Dr. L. Bitensky.

Arris and Gale Lecture  
by Mr. P. H. Golding-Wood.

Hunterian Oration  
by Sir Russell Brock.

Webb-Johnson Lecture  
by Dr. Hamilton B. G. Robinson.

Ophthalmology Lecture  
by Professor Arnold Sorsby.

Ophthalmology Lecture  
by Professor Arnold Sorsby.

Hunterian Lecture  
by Professor C. E. Drew.

Arnott Demonstration  
by Dr. R. McP. Livingston.

Otolaryngology Lecture  
by Professor L. P. Garrod.

Erasmus Wilson Demonstration  
by Dr. L. W. Proger.

Hunterian Lecture  
by Professor R. C. Connolly.

Frederic Hewitt Lecture  
by Dr. R. P. W. Shackleton.

Arris and Gale Lecture  
by Dr. J. C. Seymour.

Hunterian Lecture  
by Professor W. Bryan Jennett.

Edridge-Green Lecture  
by Dr. Walter S. Stiles.

Hunterian Lecture  
by Professor W. F. W. Southwood.

Hunterian Lecture  
by Professor J. Keith Ross.

Hunterian Lecture  
by Professor T. J. Butler.

Arnott Demonstration  
by Dr. A. A. Barton.

Hunterian Lecture  
by Professor D. P. Choyce.

Ruscoe Clarke Memorial Lecture.

Arris and Gale Lecture  
by Dr. H. E. Lewis and  
Dr. J. P. Masterton.

Otolaryngology Lecture  
by Dr. R. Bodley Scott.

#### FORTHCOMING LECTURES AND DEMONSTRATIONS

Thursday, 11th May, at 5 p.m.

Bland-Sutton Lecture

by Dr. F. Stansfield.

Hunterian Lecture

by Professor I. Ranger.

Thursday, 8th June, 5 p.m.

"A study of the functional anatomy of the diaphragm with special reference to the aetiology and treatment of oesophageal hiatus hernia."

Wednesday, 28th June, 5 p.m.

Arnott Demonstration

by Miss J. Dobson.

Hunterian Lecture

by Professor G. W. Milton.

Wednesday, 12th July, at 5 p.m.

"The behaviour of gastric epithelium under various conditions."

Friday, 21st July.

Charles Tomes Lecture.

#### DIARY FOR OCTOBER

Mon.	17	5.00	Erasmus Wilson Demonstration—Dr. A. R. CURRIE—Modern aspects of thyroid pathology.
Tues.	18		Final Fellowship Examination (Ophthalmology and Otolaryngology) begins.
			International Federation of Surgical Colleges: Working parties and Council.
Wed.	19		Final L.D.S. Examination (Part II) and D.M.R.D. Examination (Part II) begin.
			International Federation of Surgical Colleges: Lectures, Research Communications and Dinner.
Thurs.	20	5.00	Board of Faculty of Anaesthetists.
		5.00	International Federation of Surgical Colleges.
			Moynihan Lecture—Professor J. F. NUBOER—Recurrent peptic ulcer after gastrectomy.
Mon.	24		Dental Lectures and Clinical Conferences begin.
Wed.	26		Primary F.R.C.S. Examination and D.M.R.T. Examination (Part II) begin.
		5.00	Arnott Demonstration—DR. D. H. TOMPSETT—The injection of the blood vessels of the heart with synthetic resin.
Thurs.	27		Thomas Vicary Commemoration.
		5.00	D.PATH. Examination begins.
			Thomas Vicary Lecture—DR. CUTHBERT DUKES, O.B.E.—Genetics in relation to surgery: a historical review.
Mon.	31		Final Fellowship Examination (General Surgery) begins.

#### DIARY FOR NOVEMBER

Tues.	1	5.00	Arris and Gale Lecture—MR. N. H. PORTER—Changes in blood coagulation due to perfusion for open heart surgery.
Wed.	2	5.00	D.T.M. & H. Examination begins.
			Erasmus Wilson Demonstration—DR. J. B. ENTICKNAP—Coronary thrombosis and other forms of ischaemic heart disease.
Thurs.	10	5.00	Watson-Jones Lecture—DR. PRESTON A. WADE—The accident surgery of motorways.
		2.00	D.A. Examination begins.
Fri.	18	5.00	Ordinary Council.
Wed.	23		Board of Faculty of Dental Surgery.
Thurs.	24		First L.D.S. Examination begins.
		5.00	D.P.M. Examination (Part I) begins.
			Hunterian Lecture—PROFESSOR J. F. NUNN—The distribution of inspired gas during thoracic surgery.
Tues.	29	5.00	Hunterian Lecture—PROFESSOR H. B. STALLARD—Malignant melanoma of the choroid treated with radio-active applicators.
Wed.	30		Primary F.F.A. Examination, Second L.D.S. Examination and D.P.M. Examination (Part II) begin.

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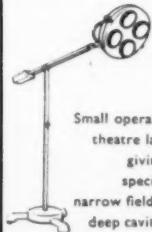
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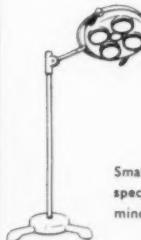
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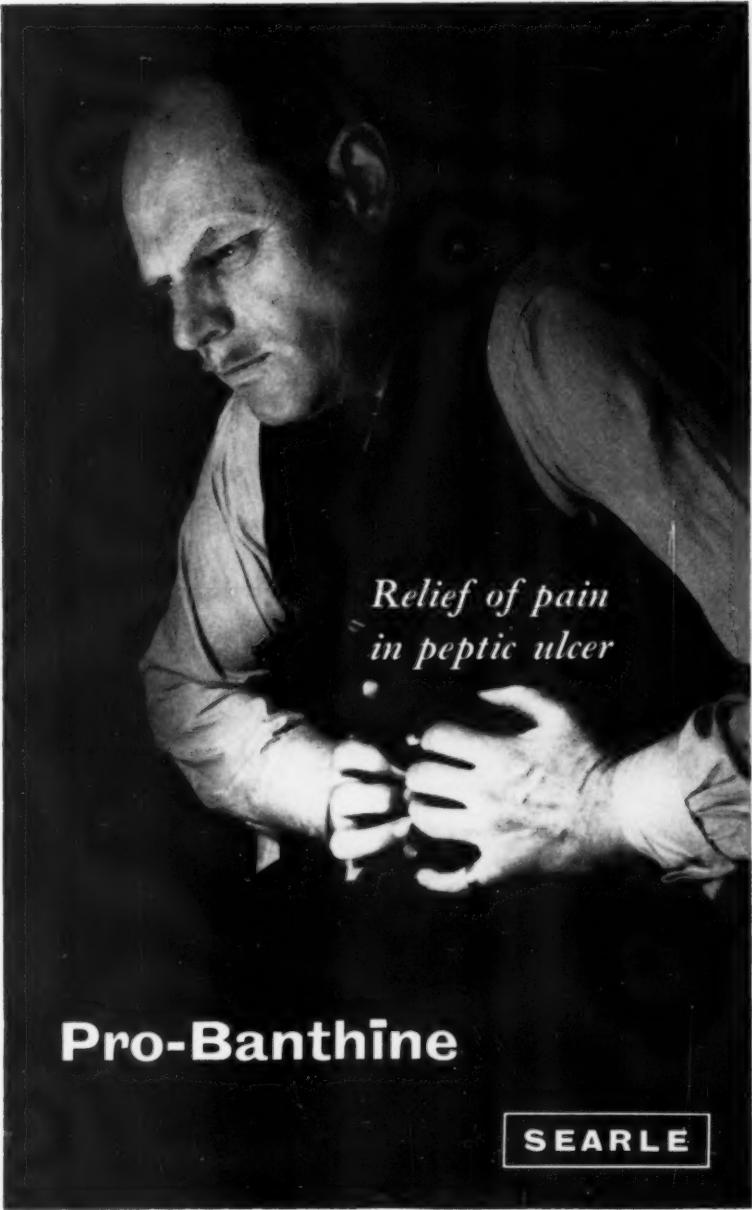
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Professor Martin Roth, M.D., Professor of Psychological Medicine, University, Durham, has kindly consented to officiate at the opening ceremony, which will take place at 11.30 a.m. Monday, 14th November.

Films of professional interest will, as usual, be shown each day in the Film Theatre.

Official personal invitations will be posted to members of the profession and if not received by November 4th, please apply to:

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194/200, Bishopsgate,  
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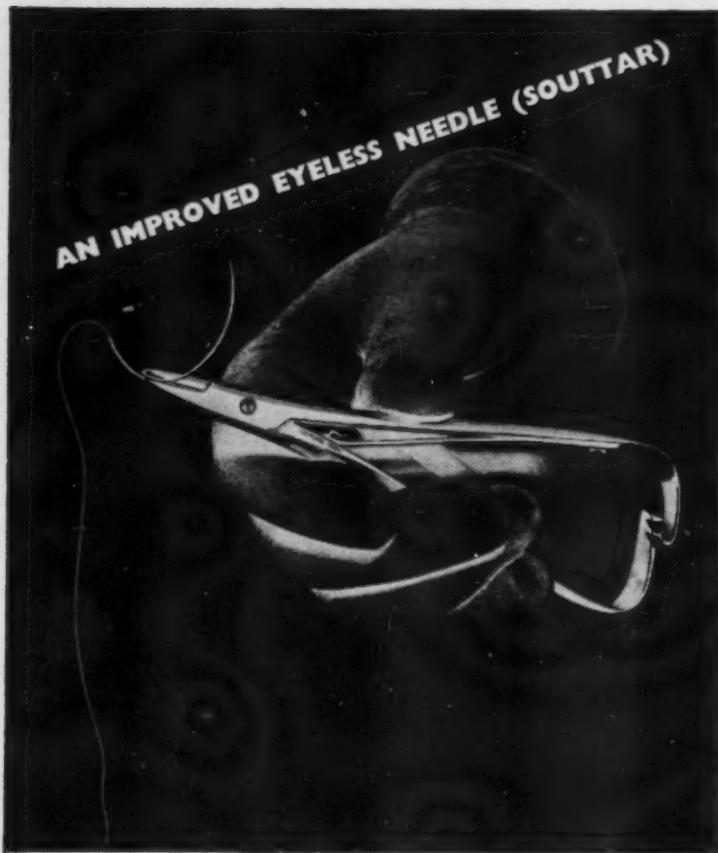
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